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MVMA SIDE IMPACT TESTING

MDB-TO-CAR SIDE IMPACT TEST OF
A 26° CRABBED MOVING DEFORMABLE BARRIER
TO A 1985 FORD LTD
AT 33.6 MPH

PREPARED BY:

TRANSPORTATION RESEARCH CENTER OF OHIO
ST. RT. 33 LOGAN COUNTY
EAST LIBERTY, OHIO 43319

TEST REPORT

TEST NO.: 850529

TEST DATE: MAY 29, 1985

TEST CONDITIONS: BASELINE STRUCTURE, DUMMY
SEATED AGAINST HARDBOARD DOOR PANEL

PREPARED FOR:

MGA RESEARCH CORPORATION
12790 MAIN ROAD
AKRON, NEW YORK 14001-0071

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Prepared By: B. L. Wade

B. L. Wade

Project Engineer

Transportation Research Center of Ohio

Approved By: J. F. Shultis 6/28/85

J. F. Shultis

Manager, Impact Laboratory

Transportation Research Center of Ohio

METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures		
Symbol	When You Know Multiply by	To Find Symbol
LENGTH		
in	2.5	centimeters cm
ft	30	centimeters cm
yd	0.9	meters m
mi	1.6	kilometers km
AREA		
in ²	6.5	square centimeters cm ²
ft ²	0.09	square meters m ²
yd ²	0.8	square meters m ²
mi ²	2.6	square kilometers km ²
acres	0.4	hectares ha
MASS (weight)		
oz	28	grams g
lb	0.45	kilograms kg
short tons (2000 lb)	0.9	metric ton t
VOLUME		
teaspoons	5	milliliters ml.
Tbsp	15	milliliters ml.
in ³	16	milliliters ml.
fl oz	30	milliliters ml.
cups	0.24	liters L
pt	0.47	liters L
qt	0.95	liters L
gal	3.8	liters L
ft ³	0.03	cubic meters m ³
yd ³	0.76	cubic meters m ³
TEMPERATURE (exact)		
°F	degrees Fahrenheit	degrees Celsius °C
		subtracting 32)

Approximate Conversions from Metric Measures		
Symbol	When You Know Multiply by	To Find Symbol
LENGTH		
mm	0.04	inches in
cm	0.4	inches in
m	3.3	feet ft
m	1.1	yards yd
km	0.6	miles mi
AREA		
cm ²	0.16	square inches in ²
m ²	1.2	square yards yd ²
km ²	0.4	square miles mi ²
ha (10 000 m ²)	2.5	acres ac
MASS (weight)		
g	0.035	ounces oz
kg	2.2	pounds lb
t (1000 kg)	1.1	short tons
VOLUME		
mL	0.03	fluid ounces fl oz
mL	0.06	cubic inches in ³
L	2.1	pints pt
L	1.06	quarts qt
L	0.26	gallons gal
m ³	35	cubic feet ft ³
m ³	1.3	cubic yards yd ³
TEMPERATURE (exact)		
°C	degrees Celsius	degrees Fahrenheit °F
		add 32)

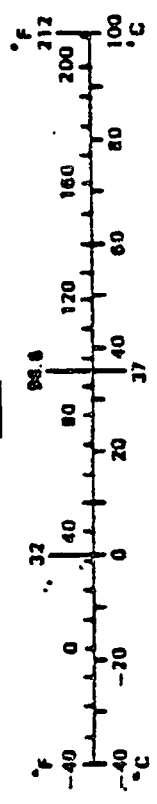


TABLE OF CONTENTS

	<u>Page</u>
1.0 PURPOSE AND INTRODUCTION	1-1
2.0 TEST PARAMETER DATA	2-1
3.0 CRASH TEST DATA	3-1
APPENDIX A PHOTOGRAPHS	A-1
APPENDIX B DATA PLOT PRESENTATION	B-1
APPENDIX C DUMMY CERTIFICATION	C-1

LIST OF PHOTOGRAPHS

<u>Figure</u>	<u>Page</u>
A-1. PRE-TEST OVERALL - VIEW 1	A-2
A-2. PRE-TEST OVERALL - VIEW 2	A-2
A-3. PRE-TEST OVERALL - VIEW 3	A-3
A-4. PRE-TEST OVERALL - VIEW 4	A-3
A-5. PRE-TEST CLOSEUP - VIEW 1	A-4
A-6. PRE-TEST PASSENGER DUMMY - VIEW 1	A-4
A-7. PRE-TEST PASSENGER DUMMY - VIEW 2	A-5
A-8. PRE-TEST PASSENGER DUMMY - VIEW 3	A-5
A-9. PRE-TEST PASSENGER DUMMY - VIEW 4	A-6
A-10. POST-TEST OVERALL - VIEW 1	A-6
A-11. POST-TEST OVERALL - VIEW 2	A-7
A-12. POST-TEST OVERALL - VIEW 3	A-7
A-13. POST-TEST OVERALL - VIEW 4	A-8
A-14. POST-TEST CLOSEUP VIEW	A-8
A-15. POST-TEST PASSENGER DUMMY - VIEW 1	A-9
A-16. POST-TEST PASSENGER DUMMY - VIEW 2	A-9
A-17. POST-TEST PASSENGER DUMMY - VIEW 3	A-10
A-18. POST-TEST PASSENGER DUMMY - VIEW 4	A-10
A-19. POST-TEST VEHICLE DAMAGE - VIEW 1	A-11
A-20. POST-TEST VEHICLE DAMAGE - VIEW 2	A-11
A-21. POST-TEST OVERHEAD VIEW	A-12
A-22. PRE-TEST MDB FACE - VIEW 1	A-12
A-23. PRE-TEST MDB FACE - VIEW 2	A-13
A-24. POST-TEST MDB FACE - VIEW 1	A-13
A-25. POST-TEST MDB FACE - VIEW 2	A-14

SECTION 1.0
PURPOSE AND INTRODUCTION

PURPOSE

The main purpose of this test was to evaluate occupant responses to a hardboard door panel in a 90° side impact crash test.

INTRODUCTION

A stationary 1985 Ford LTD 4-door sedan was impacted on the right side by a Moving Deformable Barrier (MDB) on May 29, 1985. The test was to simulate an intersection collision with the striking vehicle travelling at 30 mph and the struck vehicle travelling at 15 mph. The orientation angle of the striking vehicle was 90° clockwise with respect to the longitudinal axis of the struck vehicle. The leading edge of contact was to be 37 inches forward of the vehicle center of gravity which is defined by accident investigation to be the midpoint of the wheelbase.

To simulate this collision, the MDB was to be towed into the stationary Ford LTD at 33.5 mph with the MDB's wheels crabbed counterclockwise to 26°. The actual test speed was 33.6 mph and the actual leading edge of contact was 34.2 inches forward of the midpoint of the Ford LTD's wheelbase.

The vehicle was a baseline model with no structural modification. The front passenger inner door panel was replaced with hardboard and a side impact dummy (SID) was seated in the right front passenger seat with its shoulder just touching the hardboard.

Section 2 contains test parameter data. Section 3 contains crash test data. Appendix A contains pre-test and post-test vehicle and dummy photographs. Appendix B contains Data Plots. Appendix C contains Dummy Certification Data.

SECTION 2.0
TEST PARAMETER DATA

This section includes the following information:

1. General Test Vehicle Information
2. Dummy Temperature Control and Positioning Data
3. High Speed Camera Information
4. Transducer Information

TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Ford Motor Company
MAKE/MODEL: Ford LTD VIN: 1FABP39ADFG214512
BODY STYLE: 4-Door Sedan MODEL YEAR: 1985
NHTSA NO.: DNA COLOR: Midnight Blue
ENGINE DATA: TYPE: In Line CYLINDERS: 4 DISPLACEMENT 140 CID
TRANSMISSION DATA: Automatic
DATE VEHICLE RECEIVED: 4/24/85 ODOMETER READING: 3
DEALER'S NAME AND ADDRESS: NA

ACCESSORIES:

POWER STEERING	Yes	AUTOMATIC TRANSMISSION	Yes
POWER BRAKES	Yes	AUTOMATIC SPEED CONTROL	No
POWER SEATS	No	TILTING STEERING WHEEL	No
POWER WINDOWS	No	TELESCOPING STEERING WHEEL	No
TINTED GLASS	No	AIR CONDITIONING	No
RADIO	No	ANTI-SKID BRAKE	No
CLOCK	No	REAR WINDOW DEFROSTER	No
OTHER	None		

REMARKS:

1. IS THE VEHICLE STOCK THROUGHOUT? Yes
2. DOES VEHICLE SHOW EVIDENCE OF PRIOR ACCIDENT HISTORY? No
3. DOES VEHICLE SHOW ANY SIGNIFICANT CORROSION? No
4. CONDITION OF THE FRONT/REAR BUMPER AND FRAME: Good

DATA FROM CERTIFICATION LABEL ON LEFT DOOR FACE OR "B" POST:

VEHICLE MANUFACTURED BY: Ford Motor Company
DATE OF MANUFACTURE: 4/85
GVWR: 4225 LBS.,
GAWR: FRONT 2103 LBS., REAR 2255 LBS.

VEHICLE TIRE DATA

RECOMMENDED COLD TIRE PRESSURE: FRONT 30 psi; REAR 30 psi

TIRES ON VEHICLE (MFG. & LINE, SIZE): General Ameriway P195 75/R14

BIAS PLY, BELTED, OR RADIAL: Steel Belted Radial

PLY RATING: 3

IS SPARE TIRE "SPACE SAVER"? Yes

IS SPARE TIRE STANDARD EQUIPMENT? Yes

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (WITH MAXIMUM FLUIDS):

RIGHT FRONT	804	LBS.	RIGHT REAR	691	LBS.
LEFT FRONT	807	LBS.	LEFT REAR	667	LBS.
TOTAL FRONT WEIGHT	1611	LBS.	(54.3 % OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	1358	LBS.	(45.7 % OF TOTAL VEHICLE WEIGHT)		
TOTAL DELIVERED WEIGHT	2969	LBS.			

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE:	RF 26 1/4	;LF 26 3/16	;RR 24 5/16	;LR 24 5/16
PRE-TEST ATTITUDE:	RF 26 1/8	;LF 26 1/2	;RR 22 11/16	;LR 23 5/16
POST-TEST ATTITUDE:	RF 26	;LF 24 3/8	;RR 22 11/16	;LR 21 15/16

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 104 LBS. CARGO:

RIGHT FRONT	832	LBS.	RIGHT REAR	832	LBS.
LEFT FRONT	799	LBS.	LEFT REAR	784	LBS.
TOTAL FRONT WEIGHT	1631	LBS.	(50.2 % OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	1616	LBS.	(49.8 % OF TOTAL VEHICLE WEIGHT)		
TOTAL TEST WEIGHT	3247	LBS.			

WEIGHT OF BALLAST SECURED IN VEHICLE TRUNK AREA: 0 LBS.

TEST FLUID DATA

TEST FLUID TYPE: RED STODDARD SOLVENT 2; SPEC. GRAVITY: 0.764

KINEMATIC VISCOSITY: 0.99 CENTISTOKES

"USEABLE" CAPACITY*: NA GALLONS ACTUAL

TEST VOLUME: 15.0 GALLONS

FUEL SYSTEM CAPACITY (DATA FROM OWNERS MANUAL): 16.0 GALLONS

DETAILS OF FUEL SYSTEM: DNA

ELECTRIC FUEL PUMP: No

FUEL INJECTION: No

DOES ELECTRIC FUEL PUMP OPERATE WITH IGNITION SWITCH "ON" AND THE ENGINE NOT OPERATING? DNA

DATA FROM "RECOMMENDED TIRE PRESSURE" LABEL ON DOOR, POST, GLOVEBOX, ETC.

VEHICLE LOAD (UP TO CAPACITY): FRONT 30 psi; REAR 30 psi

RECOMMENDED TIRE SIZE: P195/75R14 LOAD RANGE X B, C,

VEHICLE CAPACITY: TYPES OF SEATS: Front - Bench
Rear - Bench

NUMBER OF OCCUPANTS (DESIGNATED SEATING CAPACITY): 3 FRONT
 3 REAR
 6 TOTAL

CARGO LOAD 100 LBS.

TOTAL 1000 LBS.

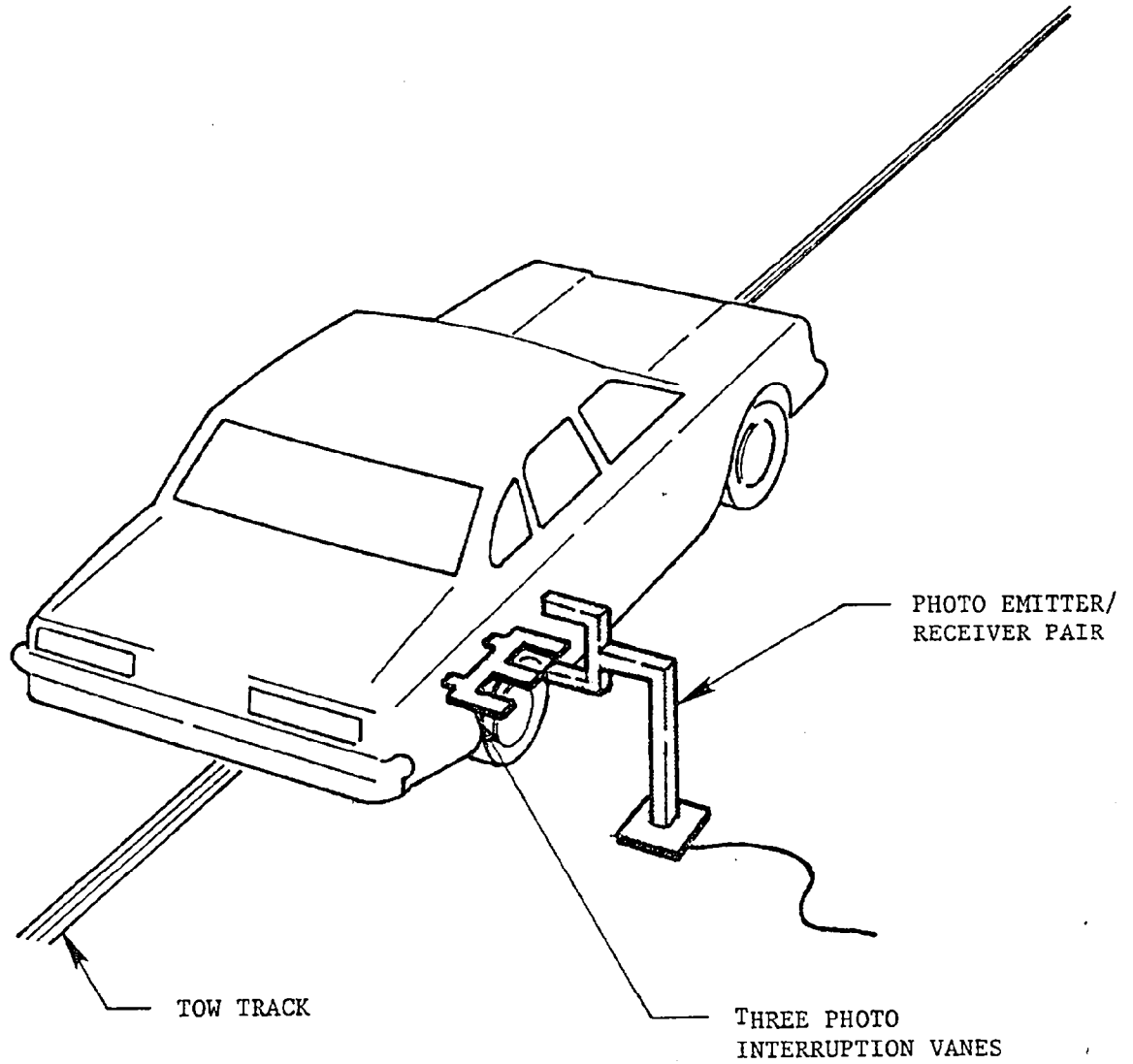
*WITH ENTIRE FUEL SYSTEM FILLED WITH FUEL TANK THROUGH CARBURETOR BOWL.

VEHICLE TEST WEIGHT CALCULATION

$$\begin{aligned} \text{Test Weight} &= \text{Unloaded Delivered Weight} + \\ &\quad \text{Number of Dummies X 174 lbs.} + \\ &\quad \text{Cargo Weight} \\ &= 2969 + 1 \text{ X } 174 + 100 \text{ lbs.} \\ &= 3243 \text{ lbs.} \end{aligned}$$

To achieve test weight, the exhaust system, battery, air pump and air cleaner were removed and 15.0 gallons of Stoddard Solvent were added in the fuel tank. The weight of the test vehicle was measured by placing each wheel on a KJ Law Force Plate.

IMPACT VELOCITY MEASUREMENT SYSTEM



The final vane clears emitter/receiver two inches before impact.

The vanes have one foot spacing.

DUMMY TEMPERATURE CONTROL AND POSITIONING

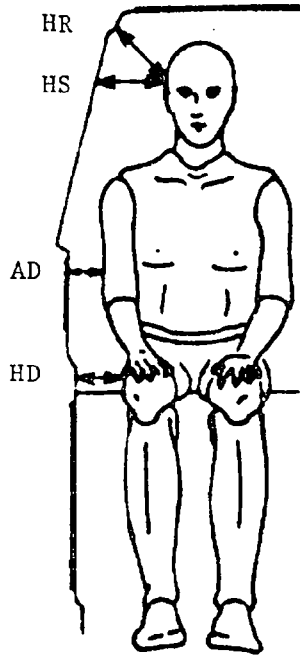
The vehicle was kept inside the temperature controlled crash test building until approximately 2 hours prior to the test. Temperature inside the vehicle and ambient temperature at the crash area were recorded. Dummy temperature while outside the crash test building was maintained portably until approximately 1 minute prior to the test.

The following table summarizes the steps taken to position the instrumented, calibrated dummies in the test vehicle.

SIDE IMPACT DUMMY SEATING PROCEDURE

The following is an outline of the Side Impact Dummy Seating Procedure which is currently being developed.

1. The seat is placed in the midpoint of the fore to aft adjustment.
2. The H-point location of the NHTSA Side Impact Dummy (SID) is located by using the SAE three-dimensional H-point machine (SAE J826 APR80 - 50TH Percentile Male Configuration). The H-point machine is positioned in the right front outboard designated seating position such that the midsagittal plane is vertical and longitudinal. The H-point is located and documented using Sections 4 through 6 of SAE Standard J826 APR80.
3. The H-point machine is removed and the SID is positioned in the right front passenger seat such that its right shoulder is either five inches from or against the hardboard or padded inner door panel. The knees are initially set 11 1/2 inches apart, measured between the outer surfaces of the knee pivot bolt heads, if possible. The H-point is then positioned to within 1/2 inch of the coordinates of the H-point machine H-point location found in Step 2 by applying force in the appropriate direction to the dummy's lower torso. If the dummy's upper torso does not rest against the seatback, position the torso without moving the H-point so the upper torso does rest against the seatback. The dummy's feet are then positioned such that the heels rest on the floorpan and the feet are on the toeboard. If the dummy's feet will not reach the toeboard, the feet are positioned such that the feet are at right angles to the lower legs. If wheelhouse projections interfere with the above positioning of the feet, the heel is placed on the floorpan with the foot perpendicular to the lower leg by twisting the foot about the ankle.
4. Prior to the crash test the dummy's longitudinal and lateral head locations are rechecked. The dummy is then visually checked.

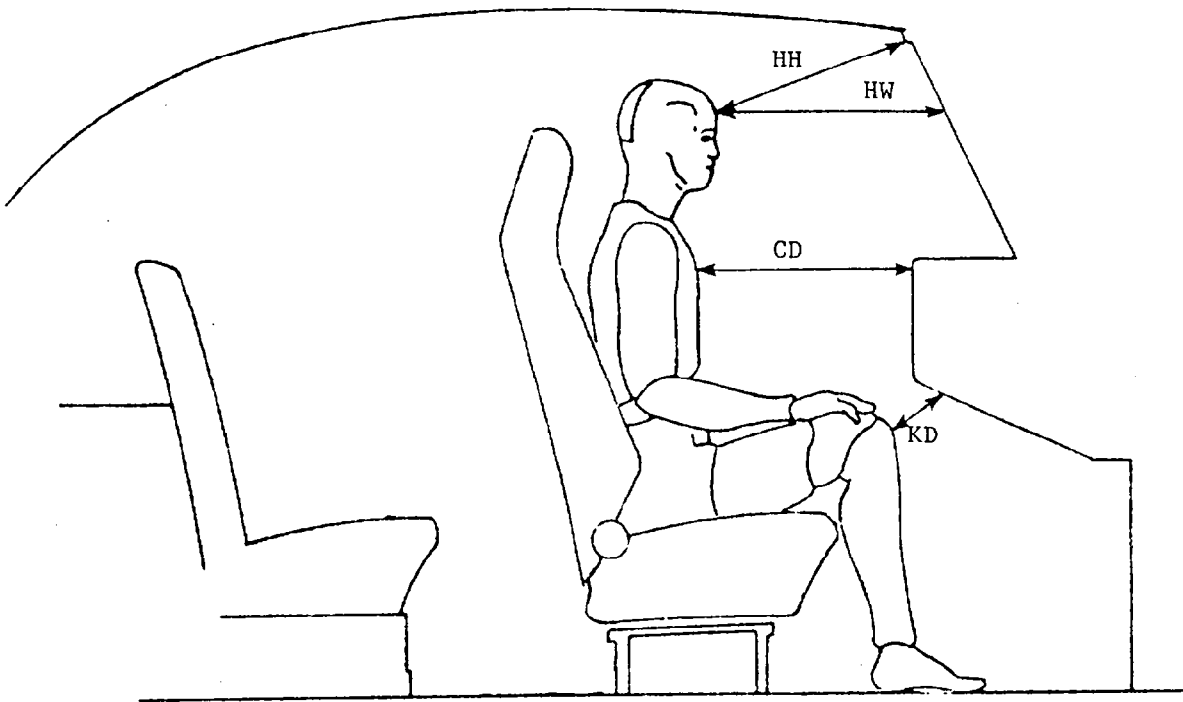


PASSENGER

HR	4 3/8
HS	4 3/4
AD	0
HD	1

ALL MEASUREMENTS IN INCHES

DUMMY LATERAL CLEARANCE DIMENSIONS



PASSENGER

HH	10 5/8
HW	17 3/16
CD	18 5/8
KDL	5 1/2
KDR	5

ALL MEASUREMENTS IN INCHES

DUMMY LONGITUDINAL CLEARANCE DIMENSION

LOCATIONS OF OFFBOARD HIGH SPEED CAMERAS

CAMERA NO.	X	Y	Z
1	-6'11 1/2"	-25'10 1/2"	+ 3'3"
2	-23'4 3/4"	+41'6 1/2"	+ 3'1"
5	0	0	+40'
6	+1'	0	+40'

Origin of Coordinate System is Point of Impact

+X = Forward with Respect to Striking Vehicle's Velocity Vector
+Y = Rightward with Respect to Striking Vehicle's Velocity Vector
+Z = Upward with Respect to Striking Vehicle's Velocity Vector

CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1		Beaulieu	15/50	24	Documentary
2	Right-Panning	Bolex	30	24	Real Time
3	MDB Wide	Photosonic 1B	13	900	View Impact
4	Overhead Tight	Photosonic 1B	25	938	View Impact
5	Overhead Wide	Photosonic 1B	8	933	Vehicle Crush
6	Right	Photosonic 1B	25	1010	Vehicle Crush
7	Left	Photosonic 1B	17	1085	Vehicle Crush
8	Onboard Windshield	Photosonic 1B	8	1000	Dummy Kinematics
9	Onboard Roof	Photosonic 1B	8	1010	Dummy Kinematics
10	Onboard Door	Photosonic 1B	8	998	Dummy Kinematics

TRANSDUCER INFORMATION

PARAMETER BEING MEASURED	LOCATION	TYPE OF TRANSDUCER	MFGR	MODEL NUMBER	SERIAL NUMBER
HEDXG2	HEAD CENTER OF GRAVITY	ACCEL.	ENDEVCO	2264	AY95
HEDYG2	HEAD CENTER OF GRAVITY	ACCEL.	ENDEVCO	2264	BA26
HEDZG2	HEAD CENTER OF GRAVITY	ACCEL.	ENDEVCO	2264	BA30
T01YG2	UPPER SPINE	ACCEL.	ENDEVCO	2264	AN61
T01ZG2	UPPER SPINE	ACCEL.	ENDEVCO	2264	AN37
T12XG2	LOWER SPINE	ACCEL.	ENDEVCO	2264	AZ55
T12YG2	LOWER SPINE	ACCEL.	ENDEVCO	2264	BA64
T12YGB	LOWER SPINE	ACCEL.	ENDEVCO	2264	AZ74
RURYG2	RIGHT UPPER RIB	ACCEL.	ENDEVCO	2264	AR82
RLRYG2	RIGHT LOWER RIB	ACCEL.	ENDEVCO	2264	AN60
RLRYGB	RIGHT LOWER RIB	ACCEL.	ENDEVCO	2264	AY78
PEVXG2	PELVIS	ACCEL.	ENDEVCO	2264	AR78
PEVYG2	PELVIS	ACCEL.	ENDEVCO	2264	AN01
PEVZG2	PELVIS	ACCEL.	ENDEVCO	2264	AJ35
RRTYD2	RIGHT RIB TO SPINE DISPLACEMENT	LINEAR POT.	BOURNS	5184	4081-191
RFDYG1	RIGHT FRONT DOOR-POSITION 1	ACCEL.	ENDEVCO	2264	AY42
RFDYG2	RIGHT FRONT DOOR-POSITION 2	ACCEL.	ENDEVCO	2264	AY12
RFDYG3	RIGHT FRONT DOOR-POSITION 3	ACCEL.	ENDEVCO	2264	BC29
LFSXG	LEFT FRONT SILL	ACCEL.	B & H*	4-202-0001	18840
LFSYG	LEFT FRONT SILL	ACCEL.	B & H	4-202-0001	18236
LFSZG	LEFT FRONT SILL	ACCEL.	B & H	4-202-0001	18837
BCGXG	BARRIER CENTER OF GRAVITY	ACCEL.	B & H	4-202-0001	18851
BCGYG	BARRIER CENTER OF GRAVITY	ACCEL.	B & H	4-202-0001	18859
BCGZG	BARRIER CENTER OF GRAVITY	ACCEL.	B & H	4-202-0001	18847
BRCXG	BARRIER REAR CROSS MEMBER	ACCEL.	B & H	4-202-0001	18240
BRCYG	BARRIER REAR CROSS MEMBER	ACCEL.	B & H	4-202-0001	19002

*Bell & Howell

SECTION 3.0
CRASH TEST DATA

The following pages are included in this section:

1. Test conditions
2. Dummy accelerometer data summary
3. Dummy contact points and kinematic summary
4. Vehicle accelerometer locations and data summary
5. Vehicle static crush table and profiles
6. Deformable moving barrier accelerometer locations and data summary
7. Test anomalies

TEST CONDITIONS

TEST NUMBER: 850529

DATE OF TEST: May 29, 1985

TIME OF TEST: 14:00

WIND VELOCITY: 0-2 mph 333°

HUMIDITY: NA

AMBIENT TEMPERATURE AT IMPACT AREA: 67° F

TEMPERATURE IN OCCUPANT COMPARTMENT: 71° F

DUMMY TEMPERATURE: 69° F

SUBJECT VEHICLE DATA

	<u>ACTUAL</u>	<u>INTENDED</u>
VEHICLE TEST WEIGHT (LBS.)	3247	3243
MDB TEST WEIGHT (LBS.)	2991	2992
MDB VELOCITY (MPH)*	33.6	33.5
IMPACT POINT (INCHES)**	34.2	37.0

DUMMIES

	<u>DRIVER</u>	<u>MIDDLE PASSENGER</u>	<u>RT. FRONT PASSENGER</u>	<u>LEFT REAR PASSENGER</u>	<u>RT. REAR PASSENGER</u>
TYPE:			SID		
SERIAL NO.:			119		
INSTRUMENTATION:					
HEAD ACCEL.:			3		
CHEST ACCEL.:			8		
FEMUR L.C.'S:			0		
OTHER:			3 Pelvis		

RESTRAINT SYSTEM: Dummy was unrestrained

* As measured over final one foot of travel.

** As measured forward of the midpoint of the test vehicle's wheelbase

SIDE IMPACT DUMMY DATA SUMMARY

	PASSENGER DUMMY			
	POSITIVE DIRECTION*		NEGATIVE DIRECTION**	
	MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
HEAD ACCELERATION				
LONGITUDINAL	58.58	290.62	38.32	96.62
LATERAL	44.08	290.38	---	---γ
VERTICAL	57.44	56.12	14.29	23.38
RESULTANT		73.86 @ 290.38		
HIC		---		
DELTA V (MPH)		-26.97 @ 275.75		
CHEST ACCELERATION				
UPPER SPINE				
LATERAL	31.38	58.75	104.90	30.62
VERTICAL	9.51	72.50	16.14	21.25
DELTA V (MPH)***		26.73 @ 52.13		
LOWER SPINE				
LONGITUDINAL	---	---γ	---	---γ
LATERAL (P)****	17.63	51.88	104.89	25.63
LATERAL (R)	21.98	50.63	100.42	25.63
DELTA V (MPH)		-30.70 @ 45.00 (P)		
		-29.14 @ 44.88 (R)		
RIGHT UPPER RIB				
LATERAL (P)	15.61	70.00	90.22	26.87
DELTA V (MPH)		-26.12 @ 67.12		
RIGHT LOWER RIB				
LATERAL (P)	12.87	53.75	99.52	27.50
LATERAL (R)	6.08	60.62	102.57	26.87
DELTA V (MPH)		-25.68 @ 79.88 (P)		
		-27.67 @ 79.50 (R)		
PELVIS ACCELERATION				
LONGITUDINAL	15.10	21.13	30.04	30.13
LATERAL	10.85	57.00	155.65	20.63
VERTICAL	5.75	29.00	36.48	21.63
RESULTANT		159.39 @ 20.75		
DELTA V (MPH)		-29.39 @ 51.88		

SIDE IMPACT DUMMY DATA SUMMARY CONTD

PASSENGER DUMMY

	<u>POSITIVE</u>		<u>NEGATIVE</u>	
	<u>DIRECTION*</u>		<u>DIRECTION**</u>	
	<u>MAX</u>	<u>TIME</u>	<u>MAX</u>	<u>TIME</u>
	<u>(in)</u>	<u>(msec)</u>	<u>(in)</u>	<u>(msec)</u>
†RIB DEFLECTION	0.02	299.38	1.63	96.25

* LONGITUDINAL: FORWARD
LATERAL: RIGHTWARD
VERTICAL: DOWNWARD

**LONGITUDINAL: REARWARD
LATERAL: LEFTWARD
VERTICAL: UPWARD

*** For dummy channels, Delta V is the velocity change at the approximate time of separation from the contact area.

**** (P) = Primary Sensor, (R) = Redundant Sensor

†Compression: Negative
‡See Test Anomalies

VISIBLE DUMMY CONTACT POINTS:

	DRIVER DNA	PASSENGER #119
Head	<u>DNA</u>	<u>Window Sill</u>
Chest	<u>DNA</u>	<u>Inner Door Panel</u>
Abdomen	<u>DNA</u>	<u>Inner Door Panel</u>
Left Knee	<u>DNA</u>	<u>Right Knee</u>
Right Knee	<u>DNA</u>	<u>Inner Door Panel</u>

DOOR OPENING:

	LEFT	RIGHT
Front	<u>Easy</u>	<u>Tools Required</u>
Rear	<u>Easy</u>	<u>Tools Required</u>

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
Front	<u>None</u>	<u>None</u>
Rear	<u>None</u>	<u>None</u>

GLAZING DAMAGE:

All right side door glass was shattered.

Windshield was cracked.

OTHER NOTABLE IMPACT EFFECTS:

DUMMY KINEMATIC SUMMARY

During impact the dummy's hip and torso contacted the inner door panel as its head pivoted about the neck and contacted the right front door window sill. The dummy rebounded from the door panel and moved across the front seat. The final resting position showed the dummy wedged between the center arm rest and the steering wheel rim and facing slightly to the right.

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

NO.	LOCATION	X*	Y*	Z*	POSITIVE** DIRECTION		NEGATIVE*** DIRECTION	
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
1	RIGHT FRONT DOOR CENTERLINE (LATERAL)	111.6	29.0	22.4	---	---γ	---	---γ
		ΔV = --- @ ---γ						
2	MIDREAR OF RIGHT FRONT DOOR (LATERAL)	101.1	28.5	24.3	50.18	21.63	103.67	10.13
		ΔV = -22.1 mph @ 36.5 msec						
3	UPPER RIGHT FRONT DOOR CENTERLINE (LATERAL)	112.4	28.5	29.8	109.97	24.63	97.91	34.50
		ΔV = -9.4 mph @ 16.13 msec						
4	MIDFRONT OF RIGHT FRONT DOOR (LATERAL)				---	---α	---	---α
5	LEFT SILL AT FRONT SEAT (LONGITUDINAL)	115.4	-27.2	13.8	6.29	45.00	4.64	98.63
	(LATERAL)	ΔV = -12.12 mph @ 80.75			16.13	114.63	20.15	41.00
	(VERTICAL)				7.75	24.63	5.12	48.00
	(RESULTANT)					20.30 @	41.00	

* Reference: X - Rear Bumper (+ Forward), Y - Vehicle Centerline (+ To Right),
Z - Ground Level (+ Up)

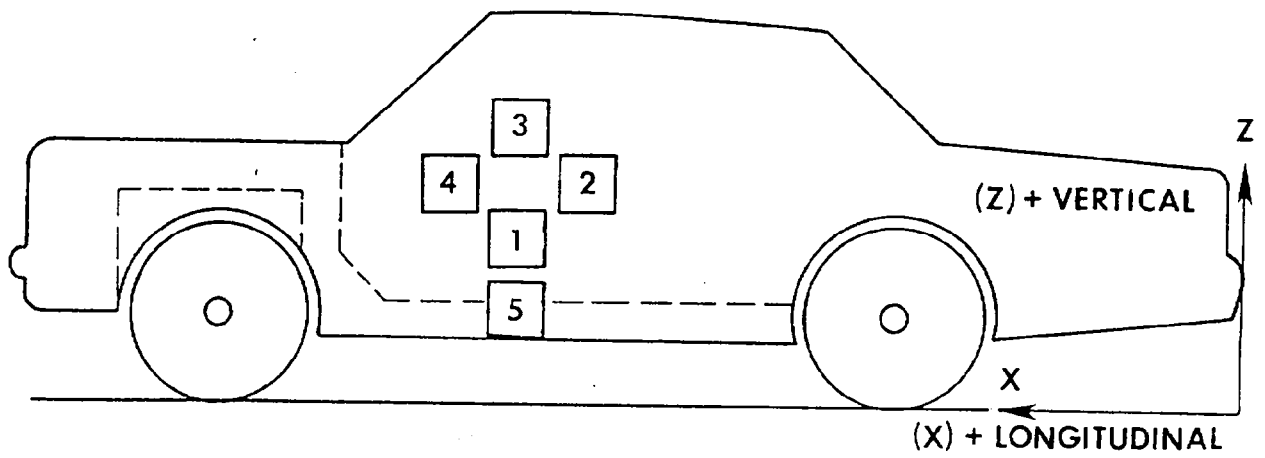
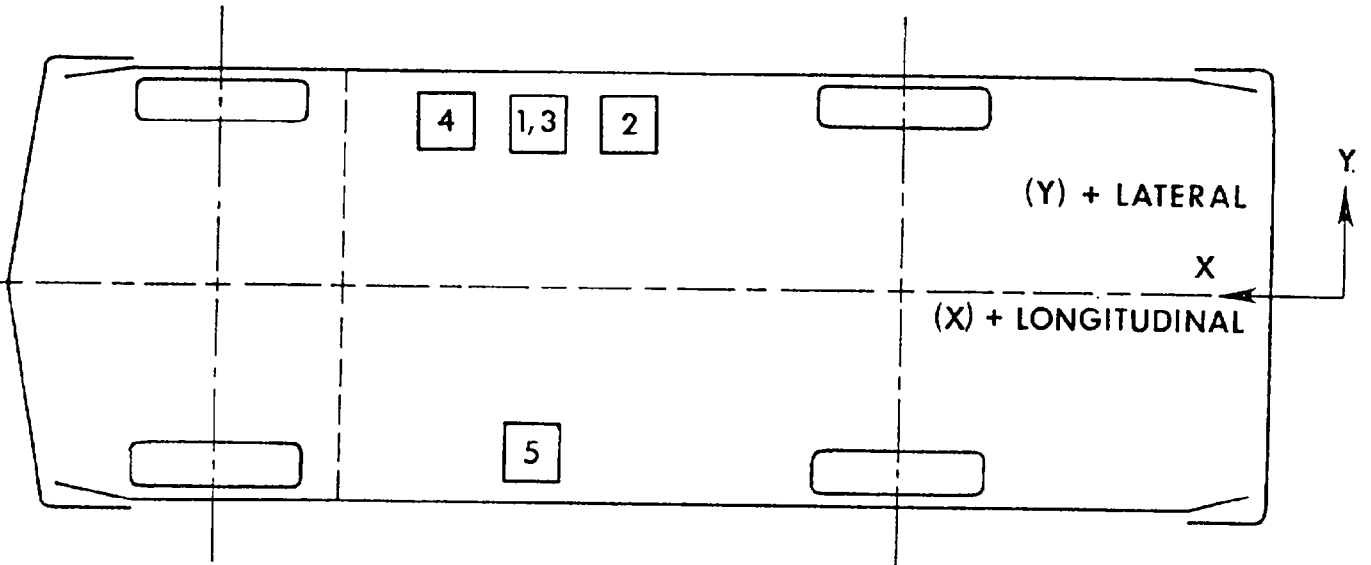
LONGITUDINAL: FORWARD *LONGITUDINAL: REARWARD
LATERAL: RIGHTWARD LATERAL: LEFTWARD
VERTICAL: DOWNWARD VERTICAL: UPWARD

All measurements of accelerometer locations in inches.

γ See Test Anomalies

α No instrumentation at this location

VEHICLE ACCELEROMETER PLACEMENT



VEHICLE EXTERIOR PROFILES AND STATIC CRUSH
 ZERO DISTANCE AT PROJECTED IMPACT POINT*

LOCATION	HEIGHT (in)	78	72	66	60	54	48	42	36	30	24	18	12	6	0	6	
		PRE-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)															
Axle Height	11.3	X	17.8	17.6	17.5	17.4	17.4	17.3	17.3	17.4	17.3	17.3	17.4	17.4	17.4	17.8	X
H-Point	21.6		13.0	13.6	13.5	13.5	13.5	13.5	13.6	13.7	13.8	13.9	14.0	14.41	14.1	X	
Window Sill	35.6		15.6	15.8	15.7	15.8	16.0	15.9	16.1	16.1	16.1	16.1	16.3	16.4	16.4	16.8	
Window Top	53.8		23.3	23.3	23.4	23.4	23.5	23.6	23.8	23.6	X	X	X	X	X	X	

POST-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)

Axle Height	11.3	X	24.8	25.0	25.6	28.3	29.0	28.5	28.3	28.0	28.1	28.1	28.0	33.3	21.8	X	
H-Point	21.6		19.2	23.1	25.6	27.1	28.5	29.8	28.6	28.3	27.9	27.5	27.1	26.8	22.5	19.9	X
Window Sill	35.6		20.0	18.5	20.0	24.0	25.3	26.8	27.0	26.0	25.8	25.5	25.0	24.3	19.6	19.4	
Window Top	53.8		26.3	26.8	27.1	27.6	28.3	28.4	28.0	28.1	27.8	X	X	X	X	X	

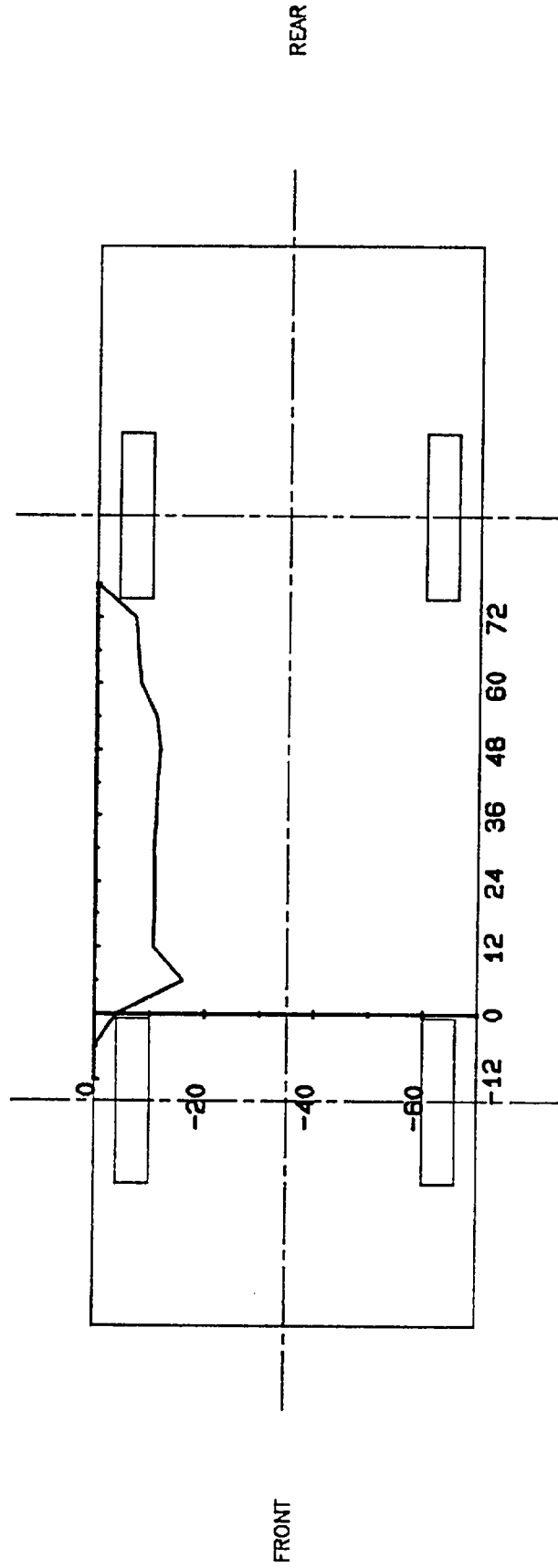
STATIC CRUSH (IN)

Axle Height	11.3	X	7.0	7.4	8.1	10.9	11.6	11.2	11.0	10.6	10.8	10.8	10.6	15.9	4.0	X	
H-Point	21.6		6.2	9.5	12.1	13.6	15.0	16.3	15.1	14.7	14.2	13.7	13.2	12.8	8.4	5.8	X
Window Sill	35.6		4.4	2.7	4.3	8.2	9.3	10.9	11.0	10.1	9.7	9.4	8.9	8.0	7.4	3.2	2.6
Window Top	53.8		3.0	3.5	3.7	4.2	5.0	4.9	4.4	4.3	4.2	X	X	X	X	X	

* Projected impact point is 37 inches forward of passenger side wheelbase midpoint. Column readings are rear to front from left to right.

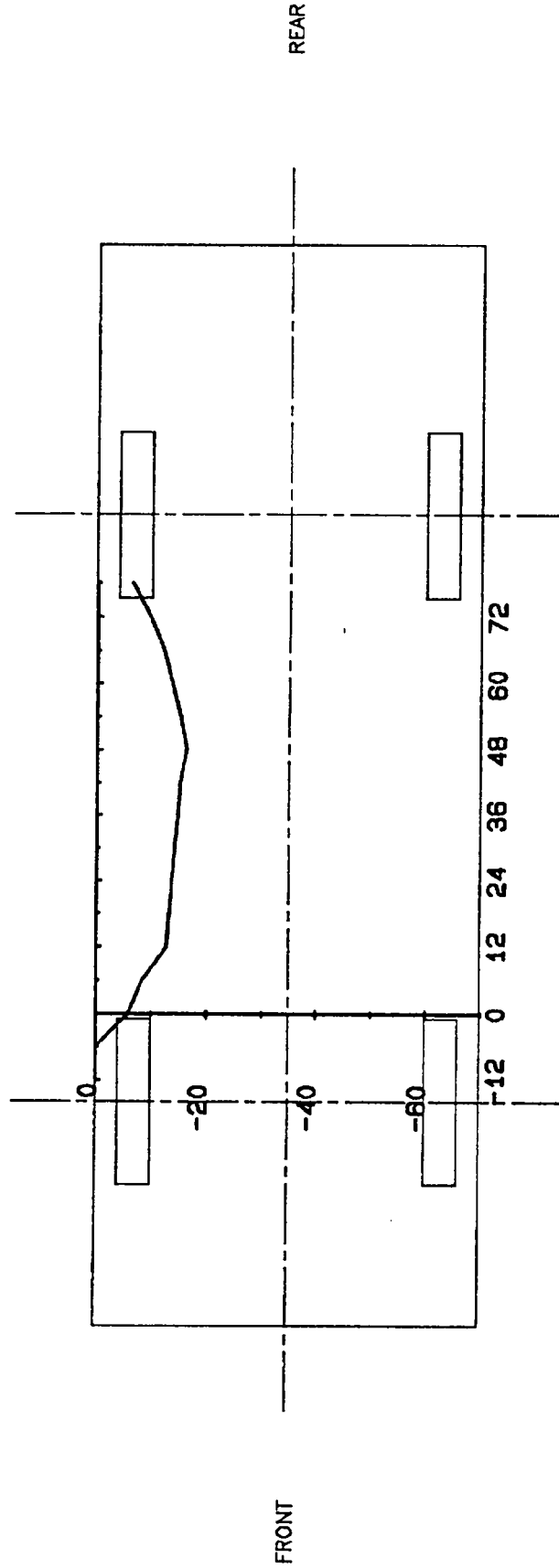
** Reference plane is parallel to and 48 inches from the vehicle longitudinal centerline.

VEHICLE EXTERIOR STATIC CRUSH PROFILE



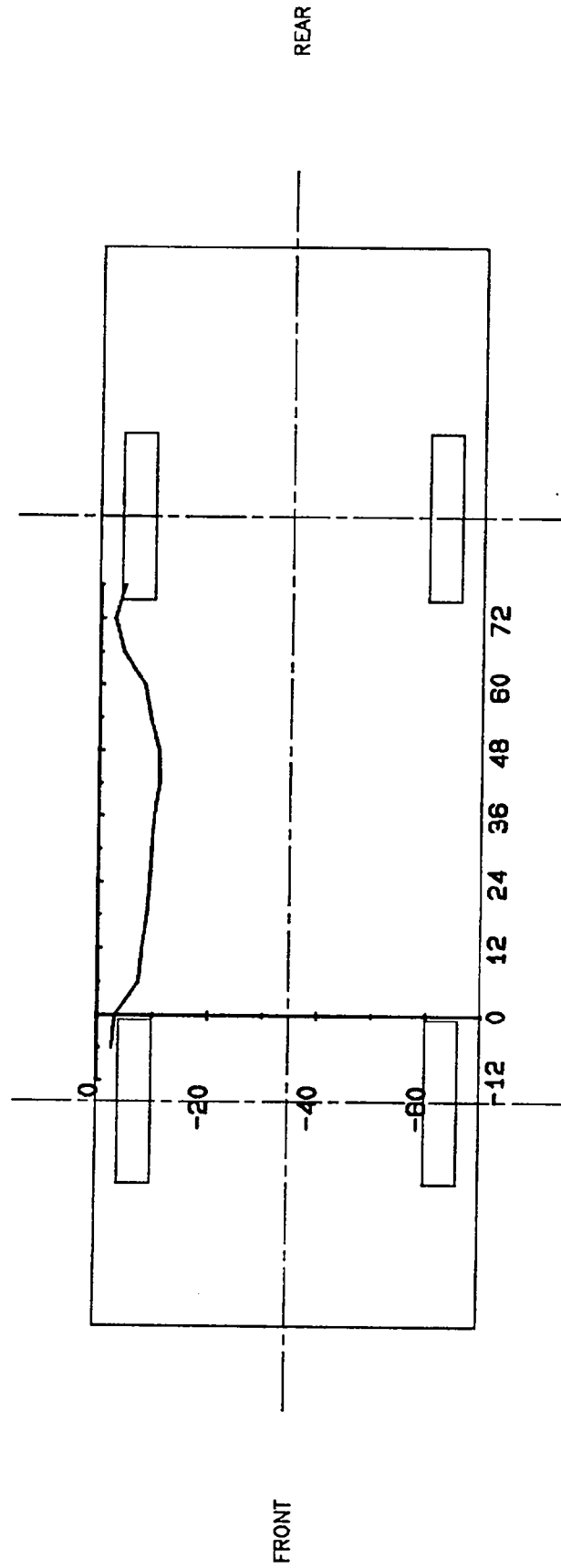
PROFILE LEVEL EQUALS AXLE HEIGHT WHICH IS 11.3" ABOVE GROUND LEVEL
(0,0) EQUALS PROJECTED IMPACT POINT
SCALE FACTOR EQUALS 0.033

VEHICLE EXTERIOR STATIC CRUSH PROFILE



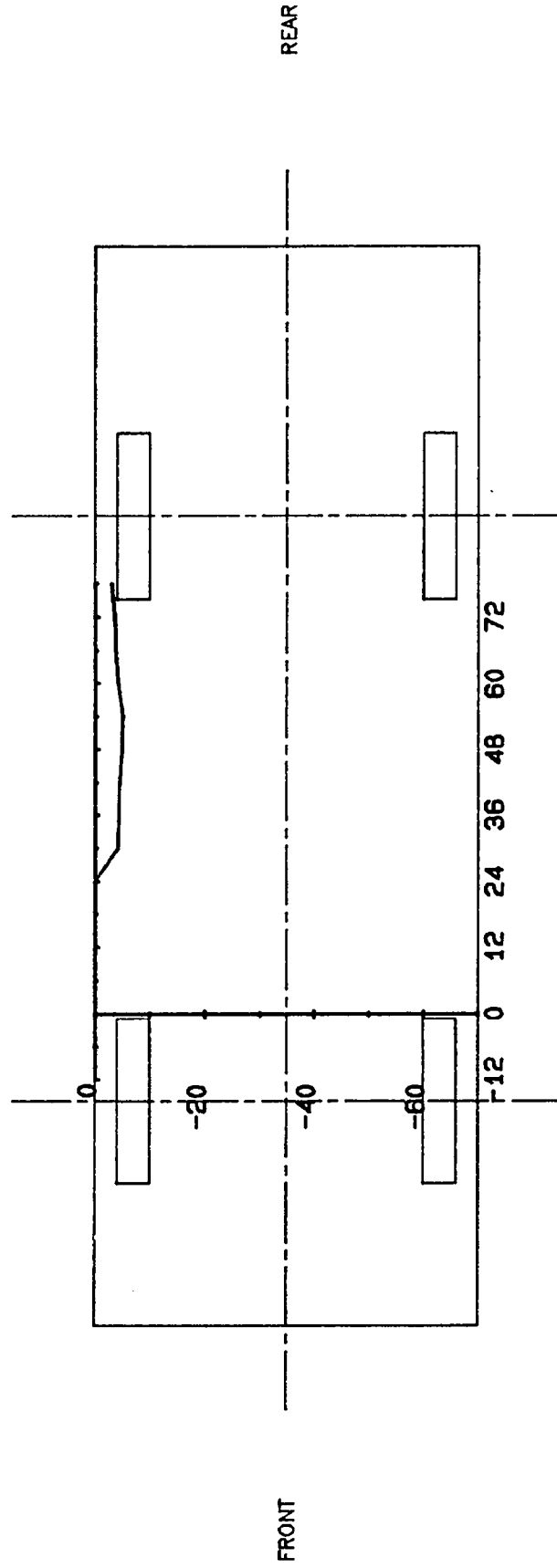
PROFILE LEVEL EQUALS H-POINT HEIGHT WHICH IS 21.6" ABOVE GROUND LEVEL
(0,0) EQUALS PROJECTED IMPACT POINT
SCALE FACTOR EQUALS 0.033

VEHICLE EXTERIOR STATIC CRUSH PROFILE



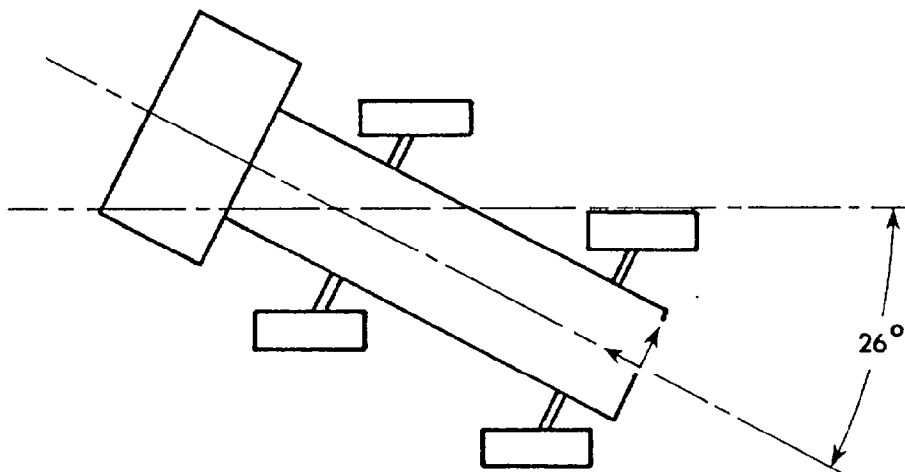
PROFILE LEVEL EQUALS WINDOW SILL HEIGHT WHICH IS 35.6" ABOVE GROUND LEVEL
(0,0) EQUALS PROJECTED IMPACT POINT
SCALE FACTOR EQUALS 0.033

VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS WINDOW TOP HEIGHT WHICH IS 53.8" ABOVE GROUND LEVEL
(0,0) EQUALS PROJECTED IMPACT POINT
SCALE FACTOR EQUALS 0.033

MOVING BARRIER ACCELEROMETER LOCATIONS AND DATA SUMMARY



NO.	LOCATION	X*	Y*	Z*	POSITIVE** DIRECTION		NEGATIVE*** DIRECTION	
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
1	CENTER OF GRAVITY	73.0	0.9	11.9				
	(LONGITUDINAL)	$\Delta V = -19.4 \text{ mph @ } 130.25 \text{ msec}$			---	---	18.74	31.25
	(LATERAL)	$\Delta V = 5.0 \text{ mph @ } 130.25 \text{ msec}$			6.72	29.75	1.21	65.00
	(VERTICAL)				4.70	50.63	8.86	37.13
	(RESULTANT)					19.90 @ 31.13		
2	REAR FRAME MEMBER	18.5	-19.2	11.9				
	(LONGITUDINAL)	$\Delta V = -14.7 \text{ mph @ } 130.25 \text{ msec}$			1.59	142.88	13.83	31.50
	(LATERAL)	$\Delta V = -1.2 \text{ mph @ } 130.25 \text{ msec}$			2.37	106.88	5.60	22.63

* Reference: X - Rear Most Point of Frame (+ To Forward), Y - Barrier Centerline (+ To Right), Z - Ground Level (+ To Up)

LONGITUDINAL: FORWARD *LONGITUDINAL: REARWARD
 LATERAL: RIGHTWARD LATERAL: LEFTWARD
 VERTICAL: DOWNWARD VERTICAL: UPWARD

All measurements of accelerometer locations in inches.

^xThere were no positive values in the time interval of interest.

TEST ANOMALIES

The following channels contain anomalous spikes due to intermittent power supply:

HEDXG2, dummy's head X-axis acceleration
HEDYG2, dummy's head Y-axis acceleration
HEDZG2, dummy's head Z-axis acceleration
RRTYDZ, dummy's right rib to spine displacement

The dummy's lower spine X-axis, T12XG2, did not record accurate data between 40 and 60 msec.

The right front door position 1 accelerometer, RFDYG1, did not record any data due to a broken transducer.

APPENDIX A
PHOTOGRAPHS

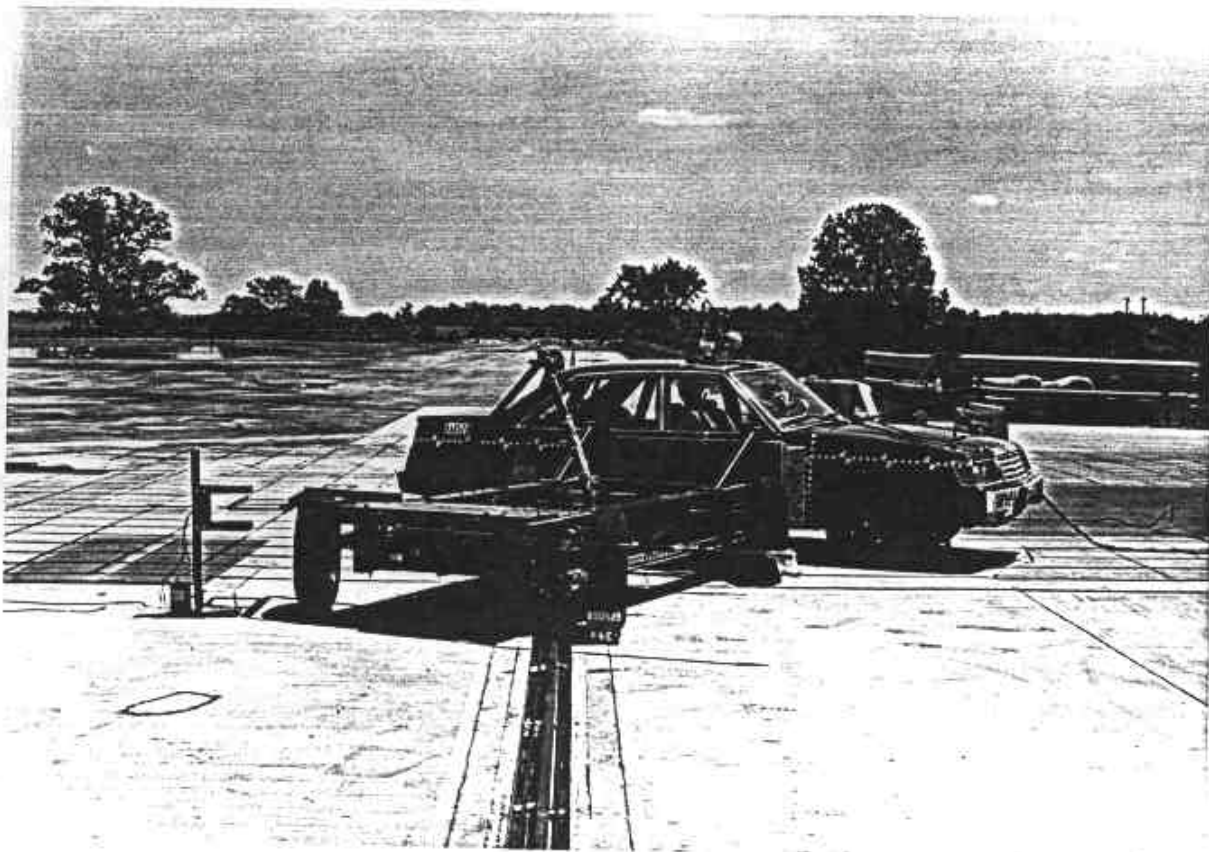


Figure A-1. PRE-TEST OVERALL - VIEW 1

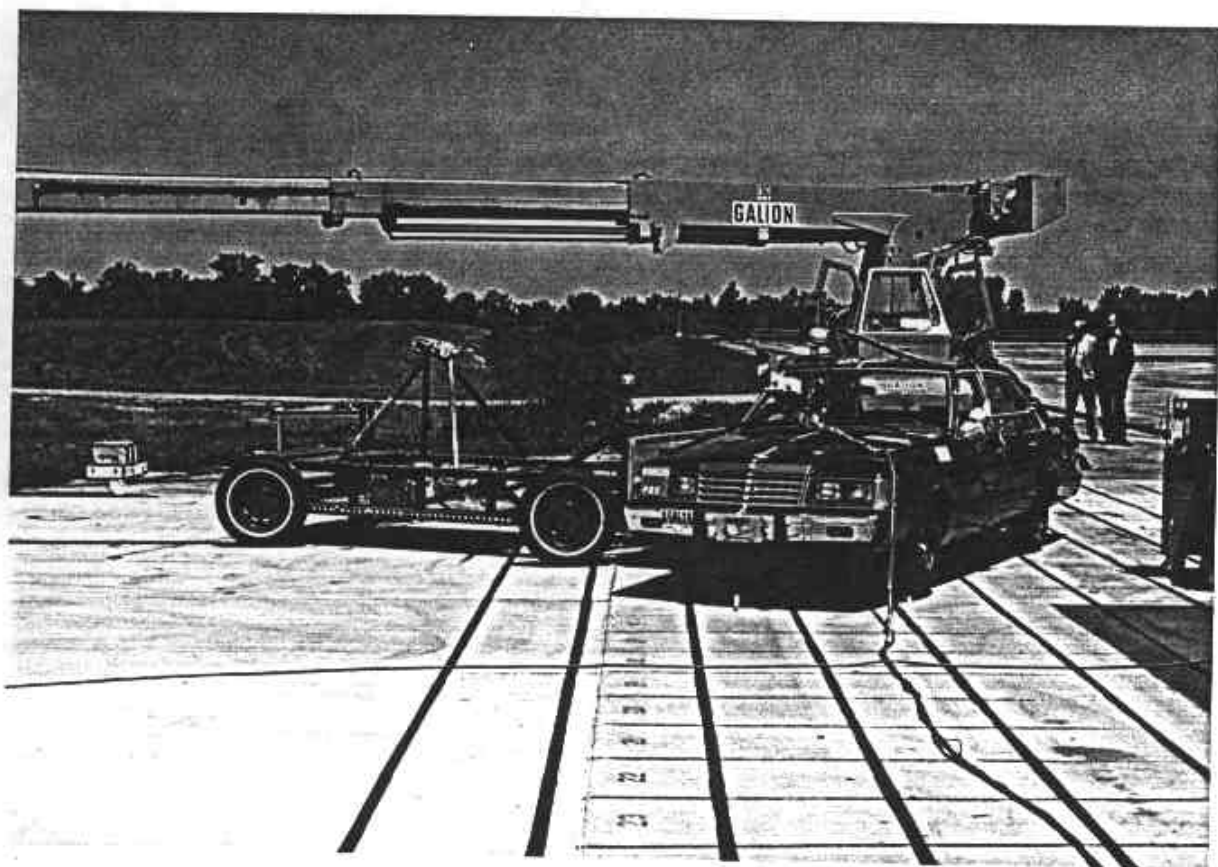


Figure A-2. PRE-TEST OVERALL - VIEW 2
A-2

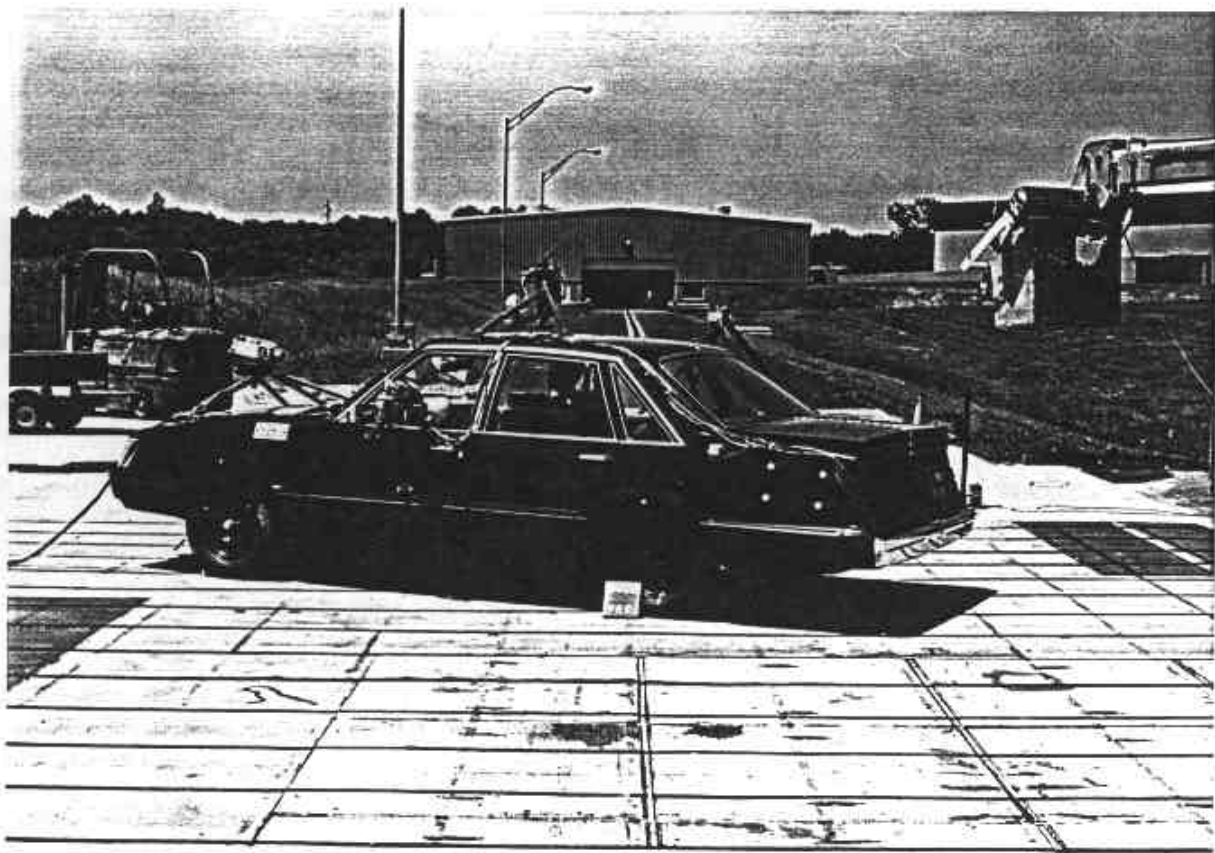


Figure A-3. PRE-TEST OVERALL - VIEW 3

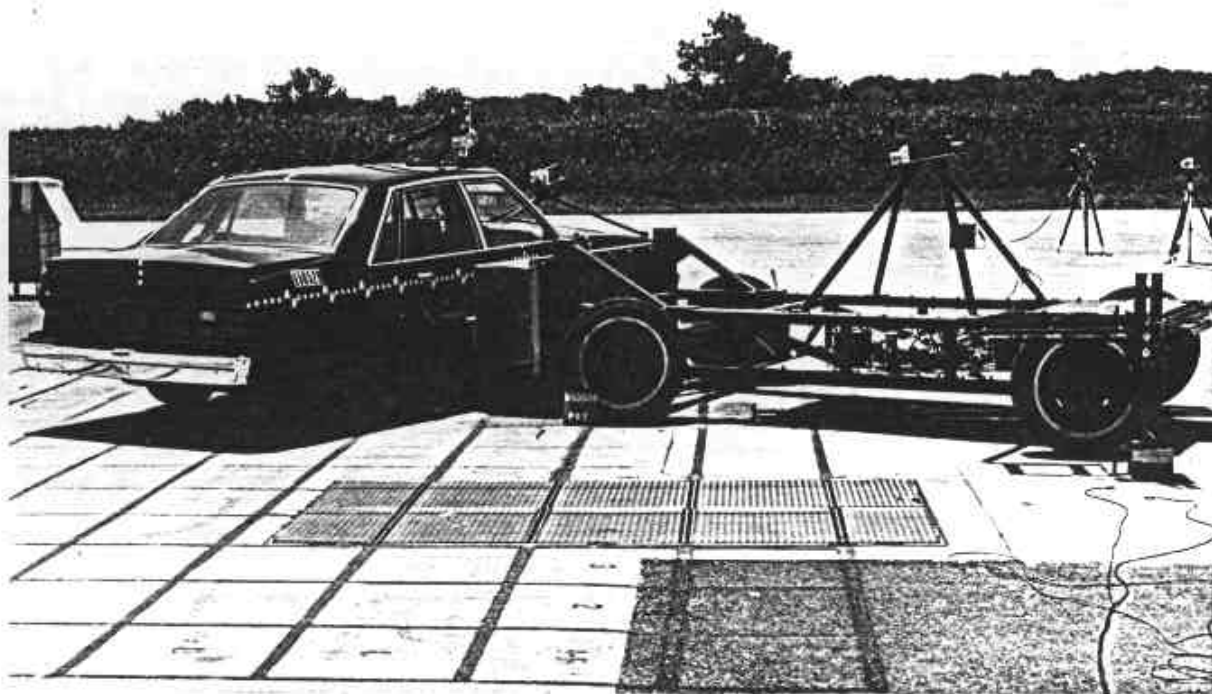


Figure A-4. PRE-TEST OVERALL - VIEW 4

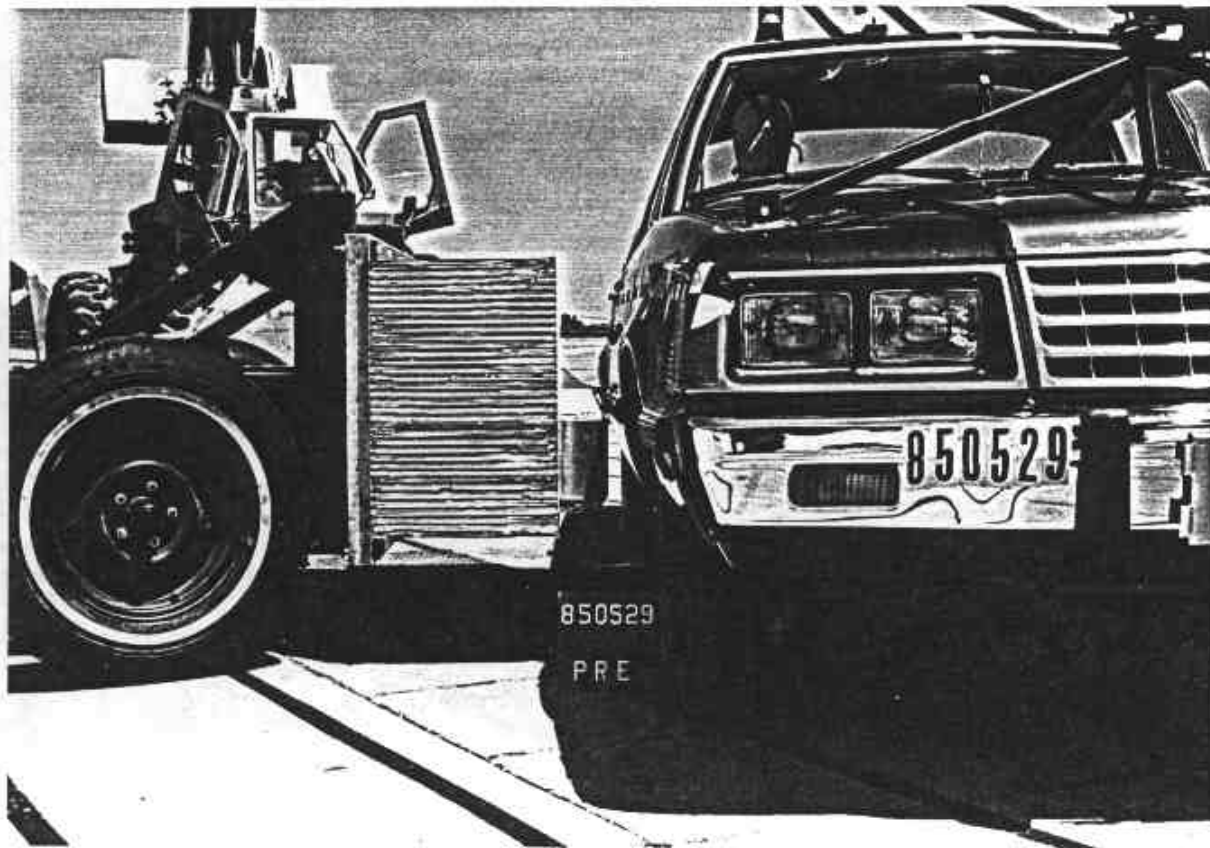


Figure A-5. PRE-TEST CLOSEUP - VIEW 1



Figure A-6. PRE-TEST PASSENGER DUMMY - VIEW 1
A-4



Figure A-7. PRE-TEST PASSENGER DUMMY - VIEW 2



Figure A-8. PRE-TEST PASSENGER DUMMY - VIEW 3
A-5



Figure A-9. PRE-TEST PASSENGER DUMMY - VIEW 4

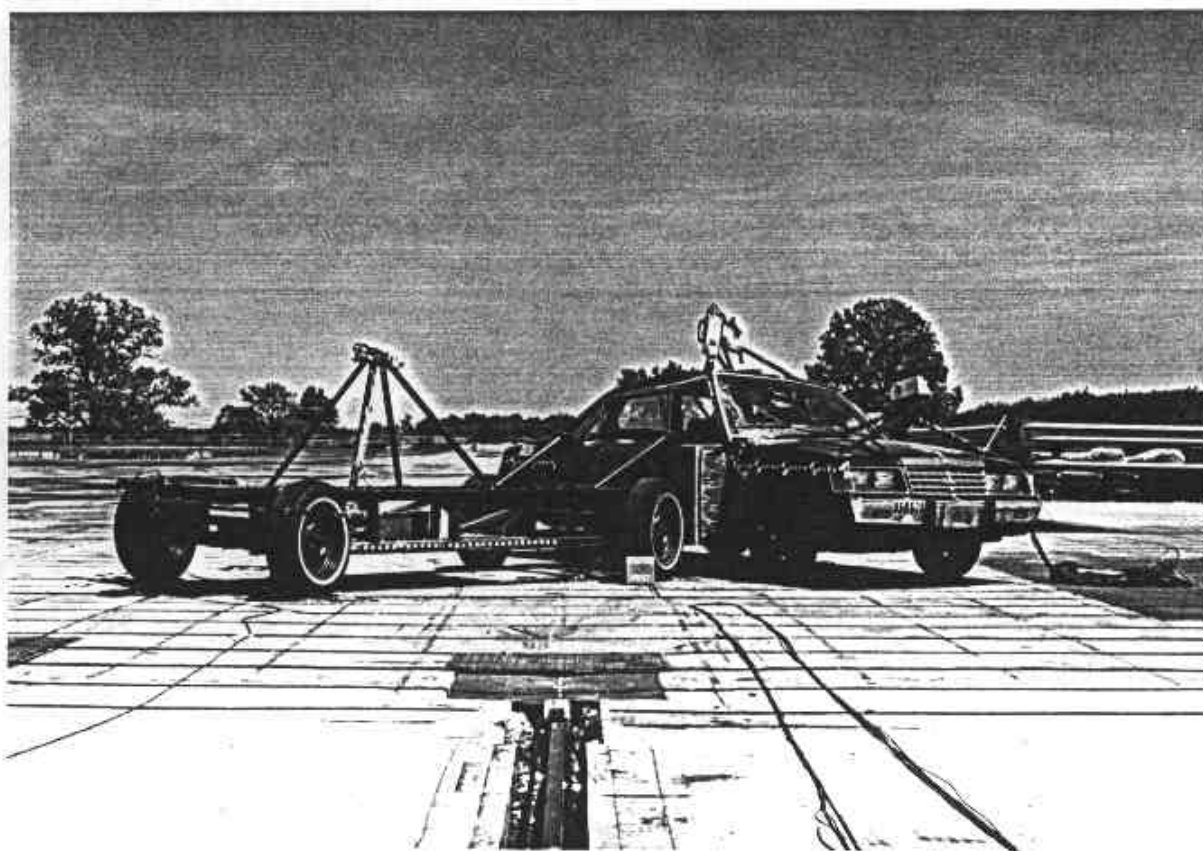


Figure A-10. POST-TEST OVERALL - VIEW 1

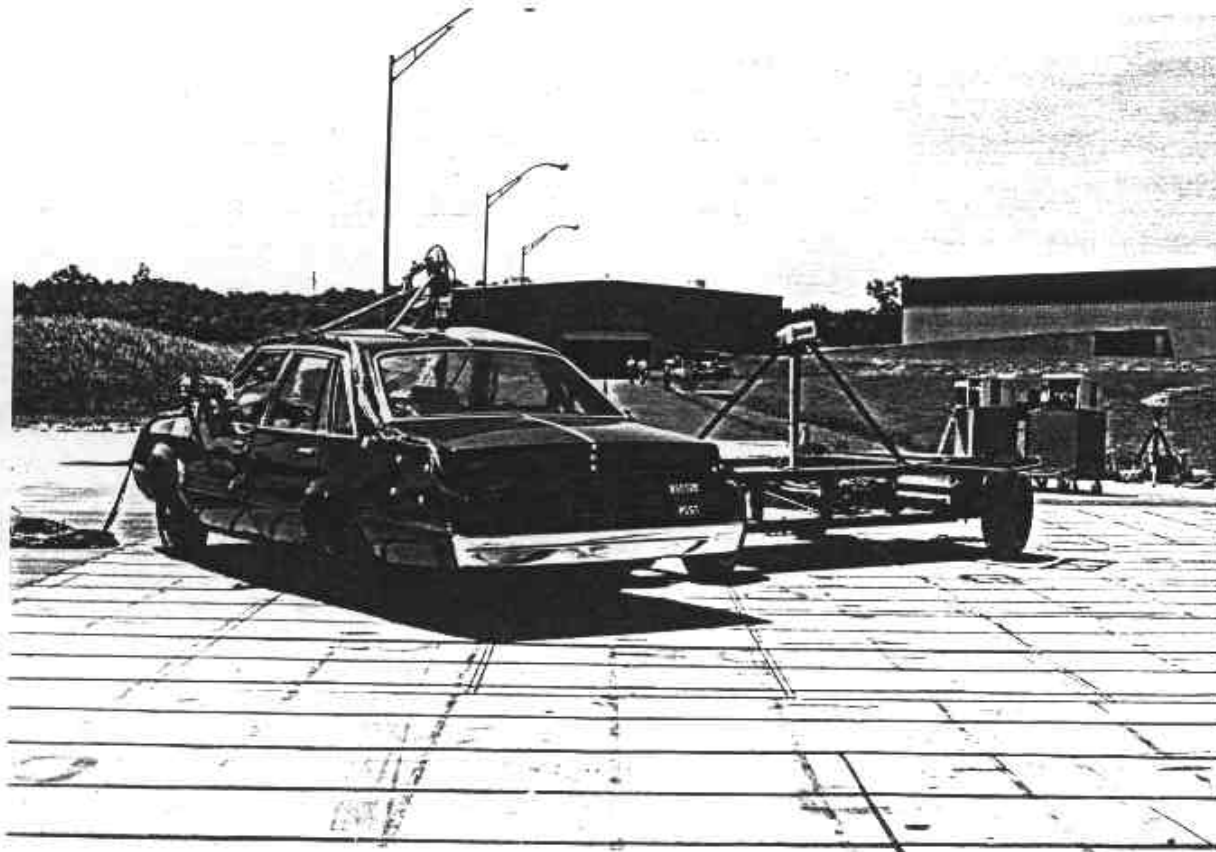


Figure A-11. POST-TEST OVERALL - VIEW 2

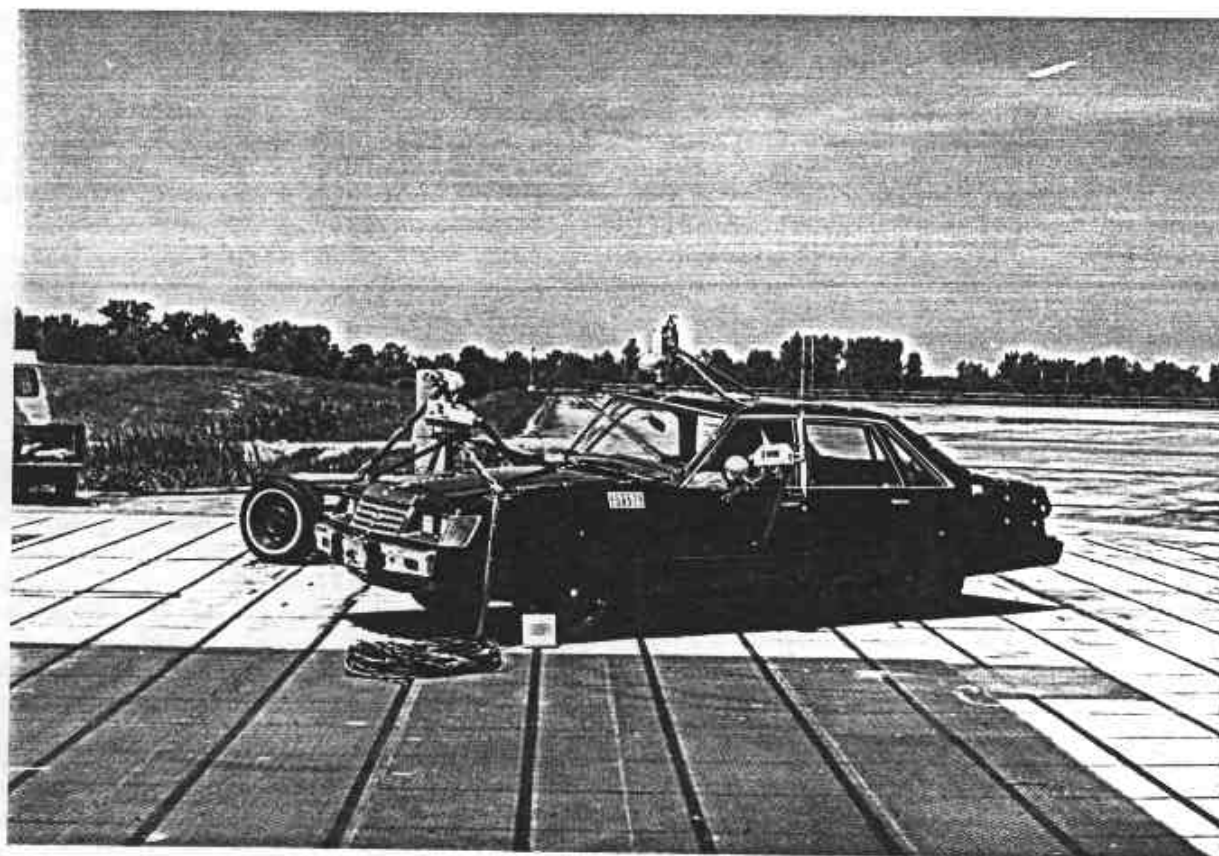


Figure A-12. POST-TEST OVERALL - VIEW 3

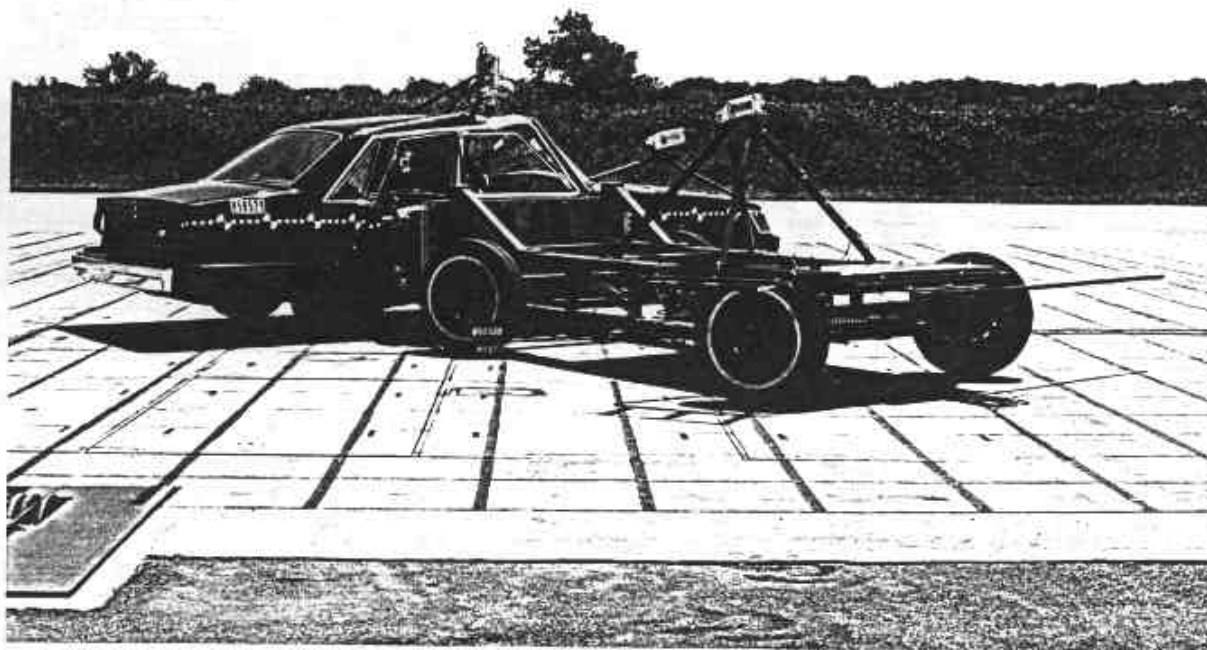


Figure A-13. POST-TEST OVERALL - VIEW 4

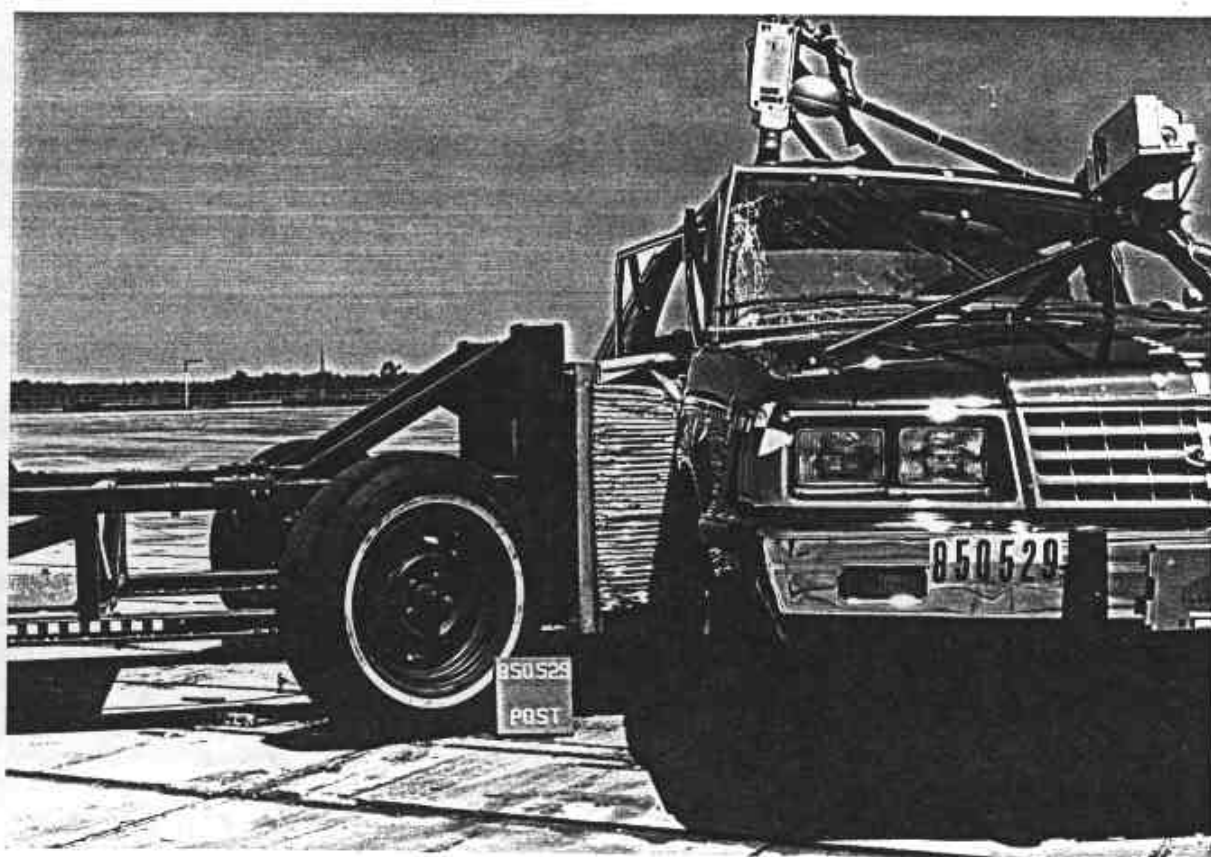


Figure A-14. POST-TEST CLOSEUP VIEW
A-8



Figure A-15. POST-TEST PASSENGER DUMMY - VIEW 1



Figure A-16. POST-TEST PASSENGER DUMMY - VIEW 2



Figure A-17. POST-TEST PASSENGER DUMMY - VIEW 3

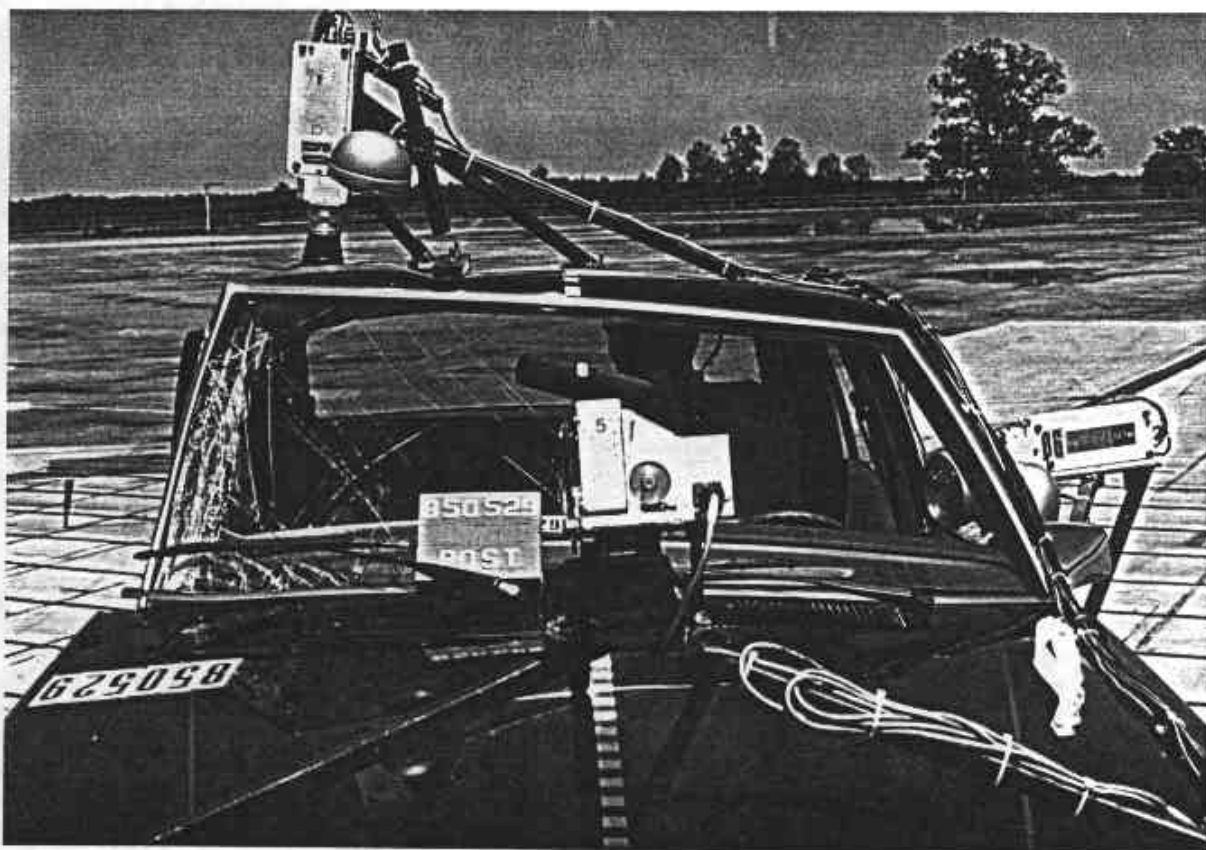


Figure A-18. POST-TEST PASSENGER DUMMY - VIEW 4

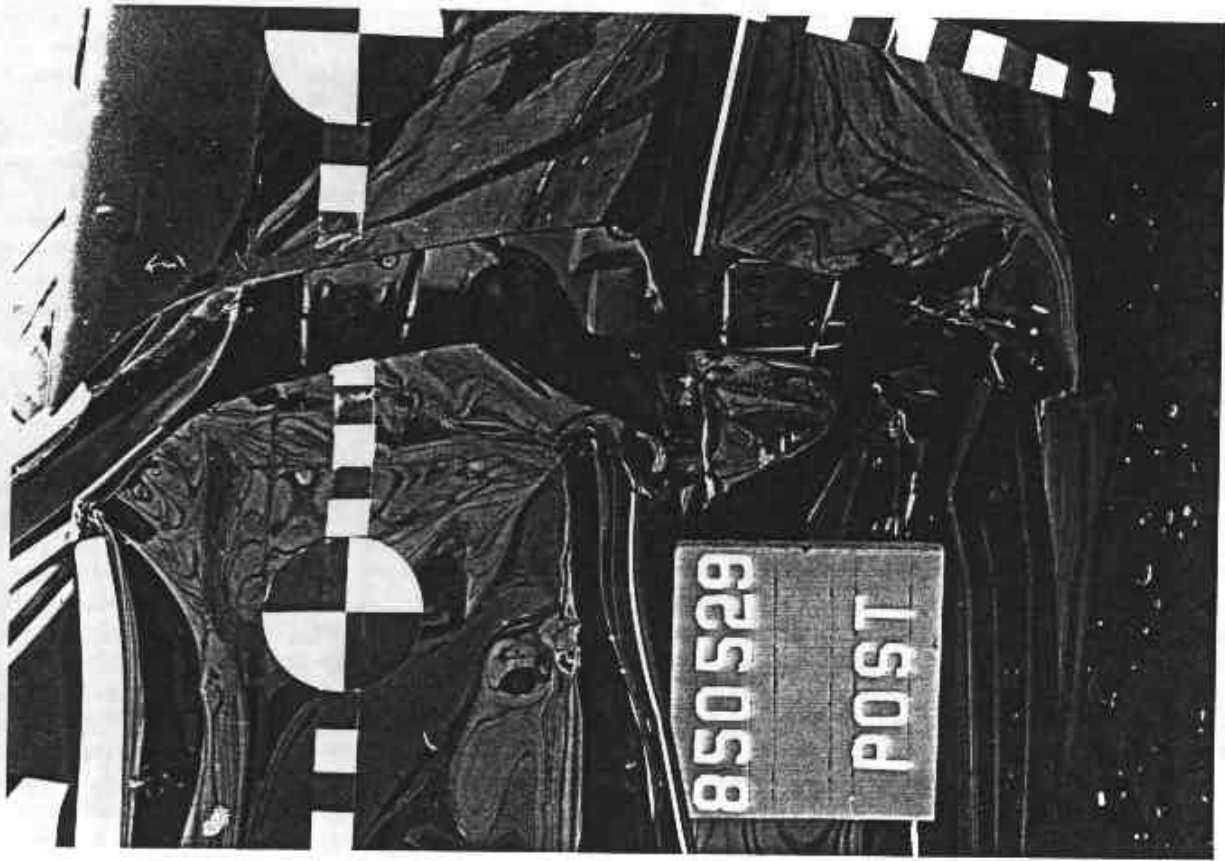


Figure A-19. POST-TEST VEHICLE DAMAGE - VIEW 1

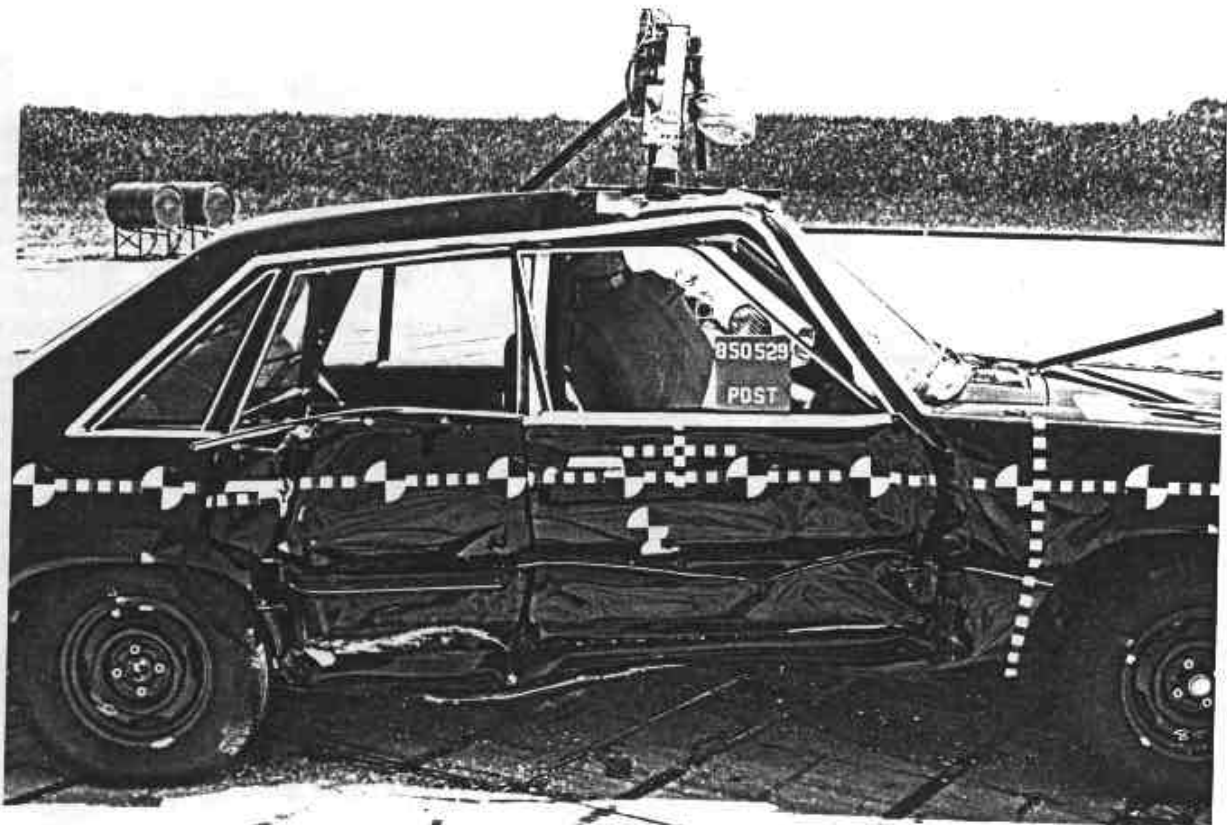


Figure A-20. POST-TEST VEHICLE DAMAGE - VIEW 2

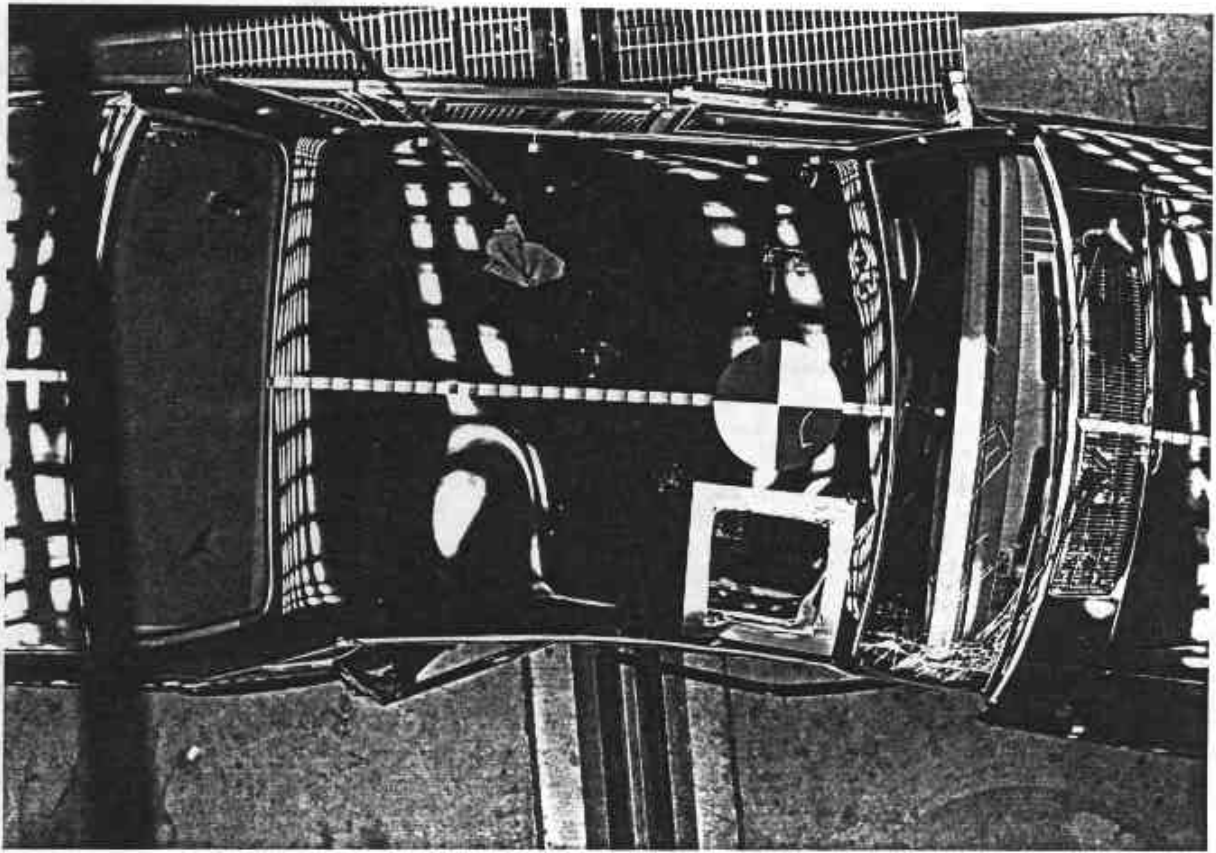


Figure A-21. POST-TEST OVERHEAD VIEW

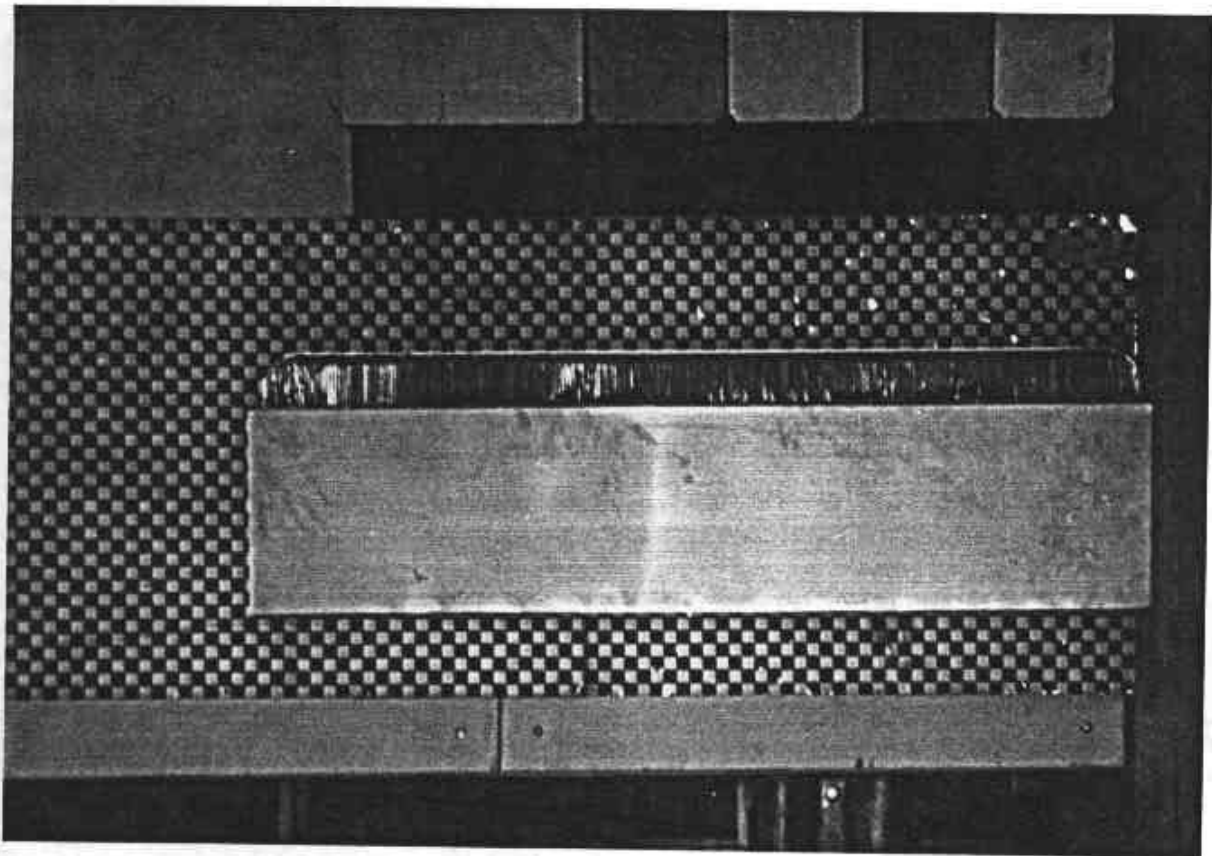


Figure A-22. PRE-TEST MDB FACE - VIEW 1
A-12

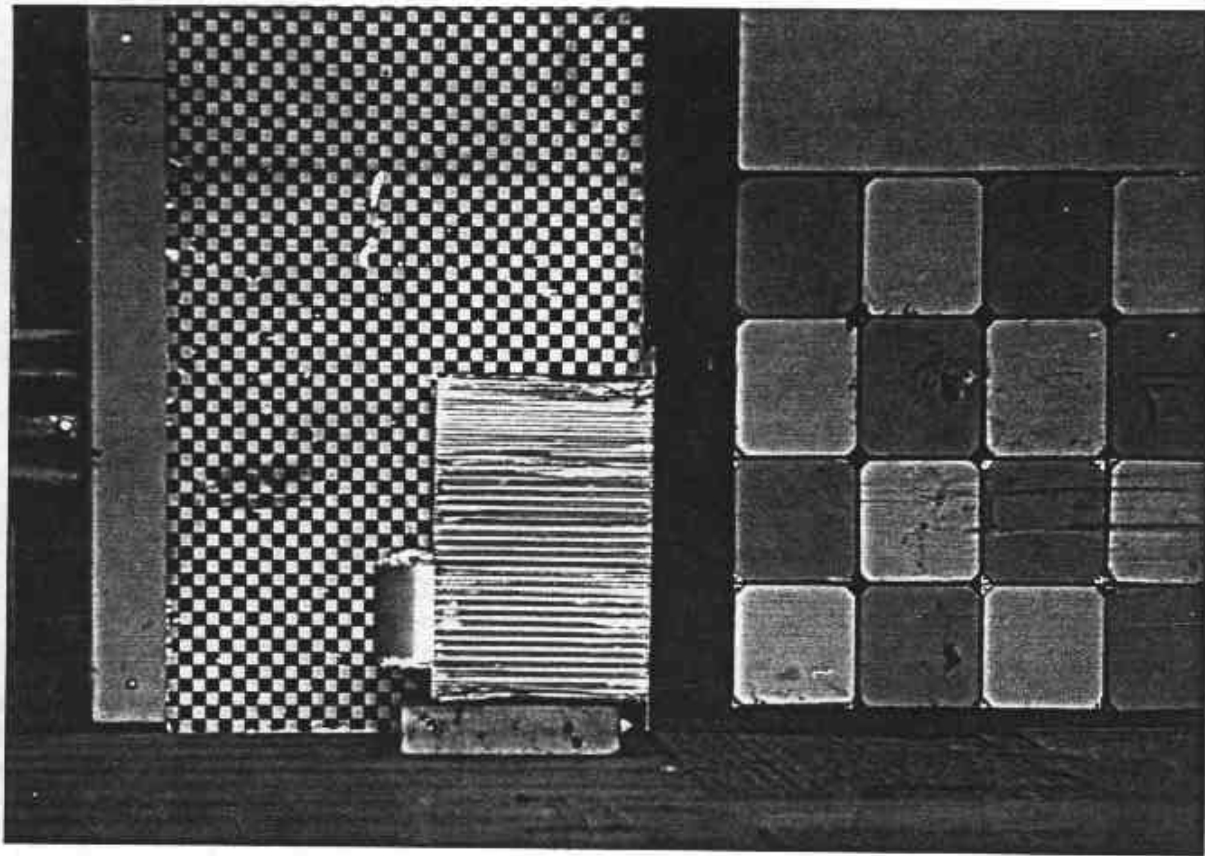


Figure A-23. PRE-TEST MDB FACE - VIEW 2

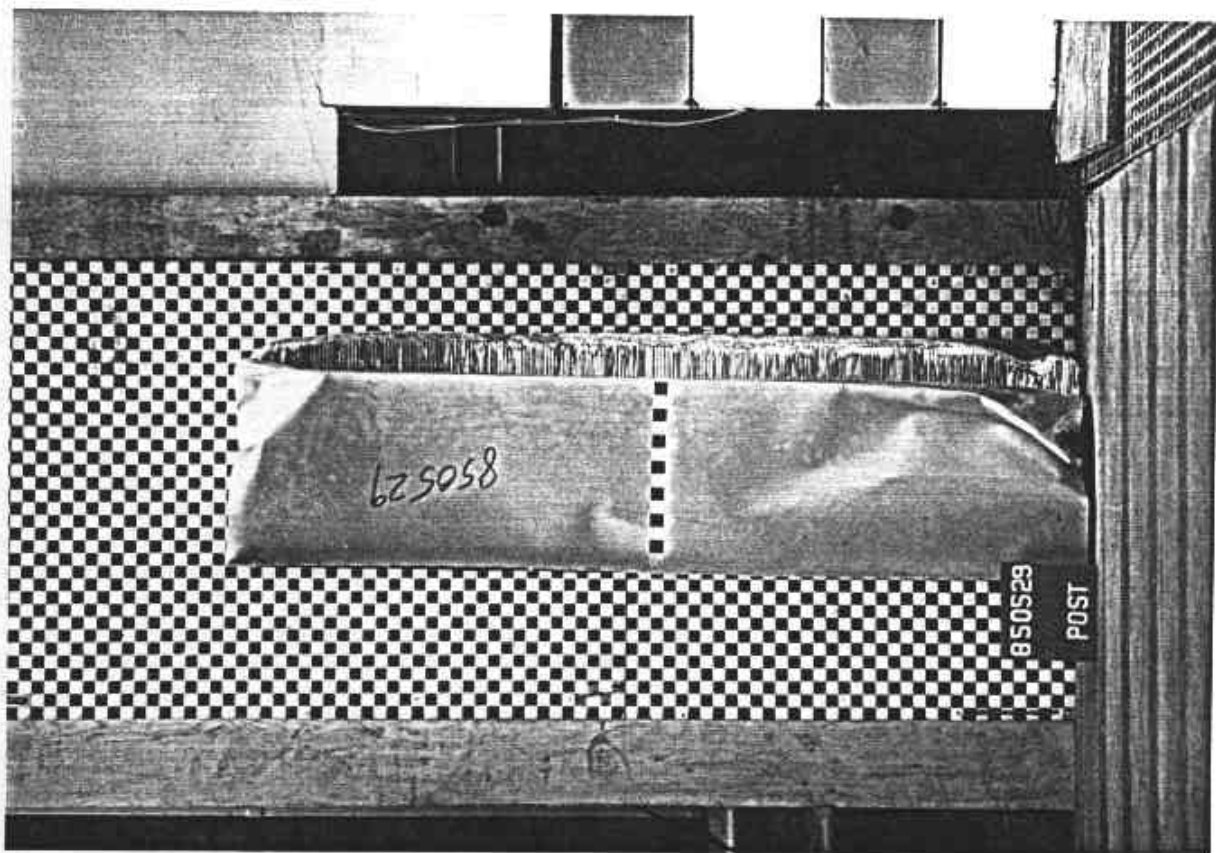


Figure A-24. POST-TEST MDB FACE - VIEW 1

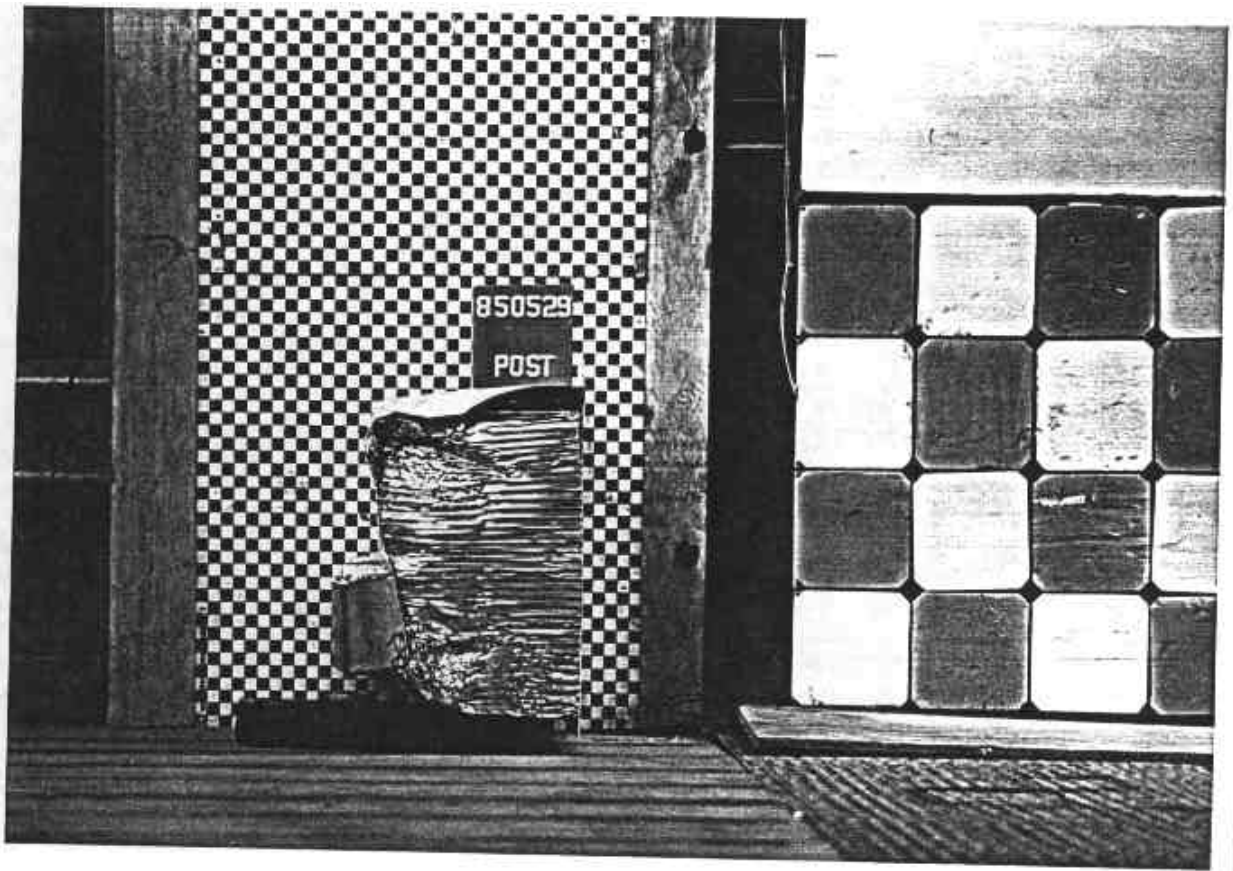


Figure A-25. POST-TEST MDB FACE - VIEW 2

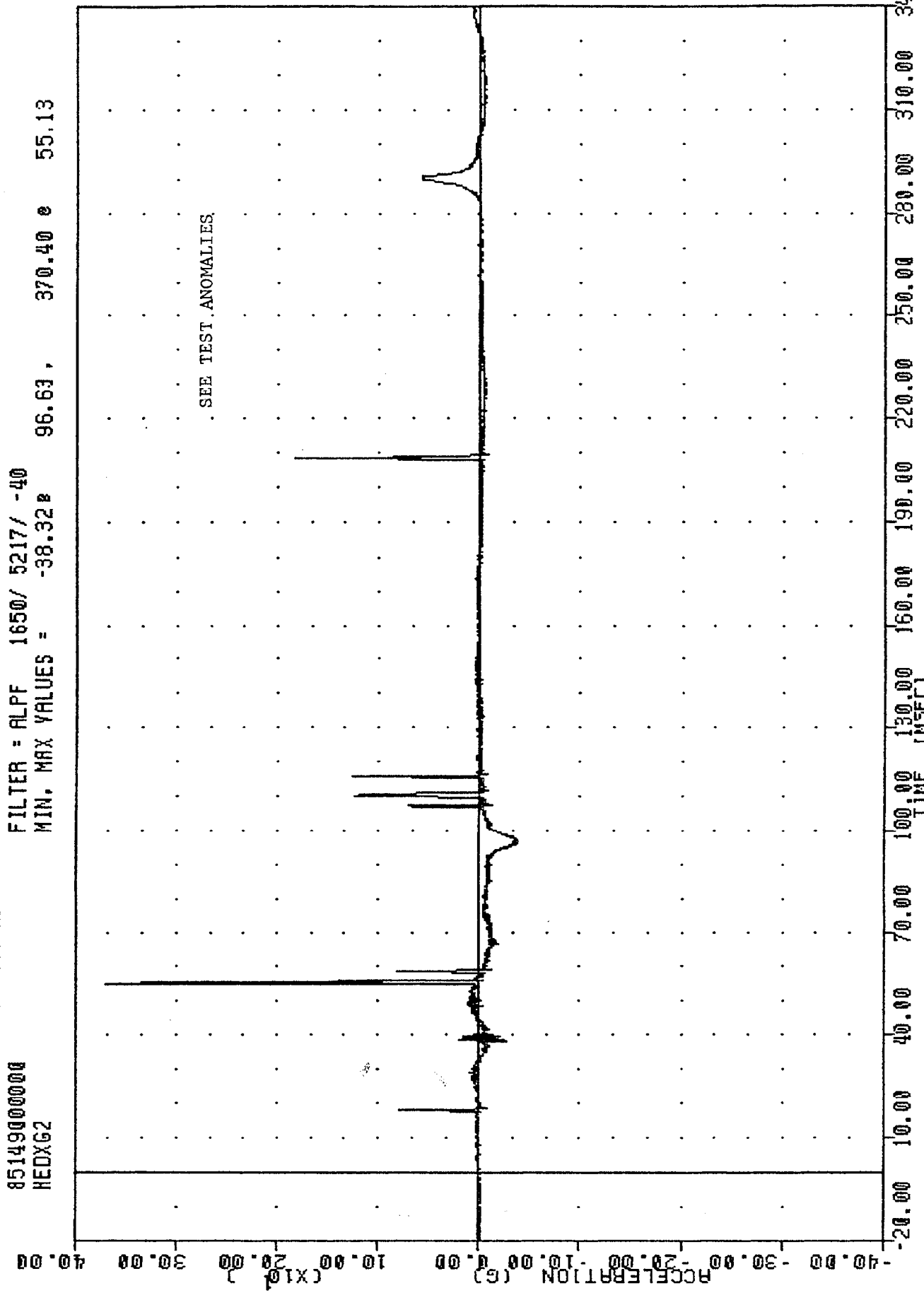
APPENDIX B
DATA PLOT PRESENTATION

Data plots generated from the crash test data are presented on the following pages. All data are recorded on magnetic tape for inclusion in the NHTSA crash test data base system. All data were filtered according to SAE J211, except that dummy thorax data were filtered using the HSRI filter.

TAC
 830529
 NYMA SIDE IMPACT TESTING
 8514900000
 HEDXG2

PLOT DATE 17-JUN-85 15:23:10

FILTER = ALPF 1650/ 5217/ -40
 MIN. MAX VALUES = -38.32 B 96.63 , 370.40 e 55.13



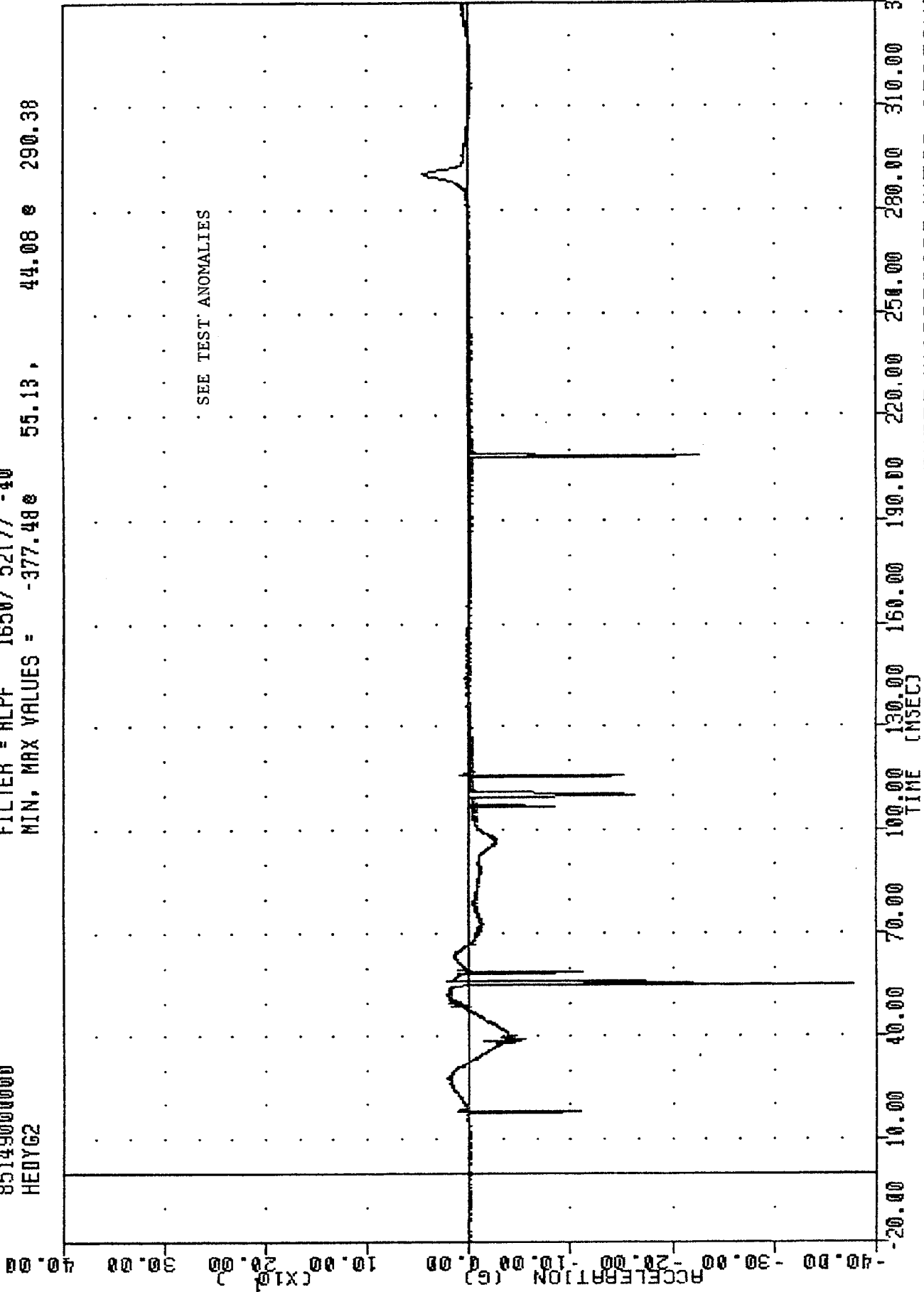
ACCELERATION (G) (X10²)
 TIME (MSEC)
 -40.00 -30.00 -20.00 -10.00 0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

NYMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 PASSENGER HEAD ACCELERATION X AXIS

TAC 850529
MVMA SIDE IMPACT TESTING
8514900000
HEDYG2

PLOT DATE 11-JUN-85 15:23:10

FILTER = ALPF 1650/ 5217/ -40
MIN, MAX VALUES = -377.48e 55.13, 44.08 e 290.38

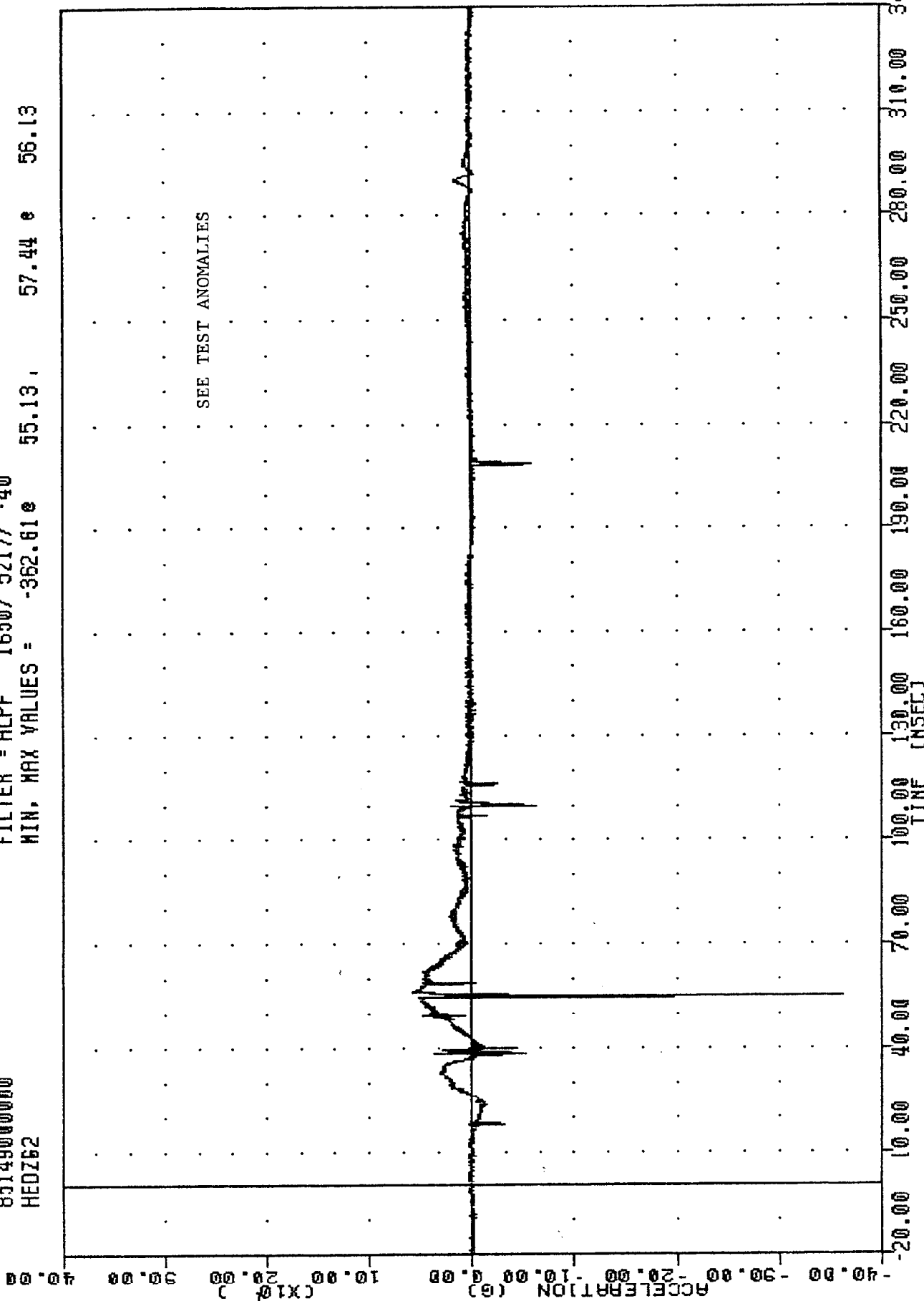


MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
PASSENGER HEAD ACCELERATION Y AXIS

TAC 850529
 MYMA SIDE IMPACT TESTING
 85149000000
 HEDZ62

PLUT DATE 11-JUN-85 15:23:10

FILTER = ALPF 1650/ 5217/ -40
 MIN, MAX VALUES = -362.61e 55.13, 57.44 e 56.13



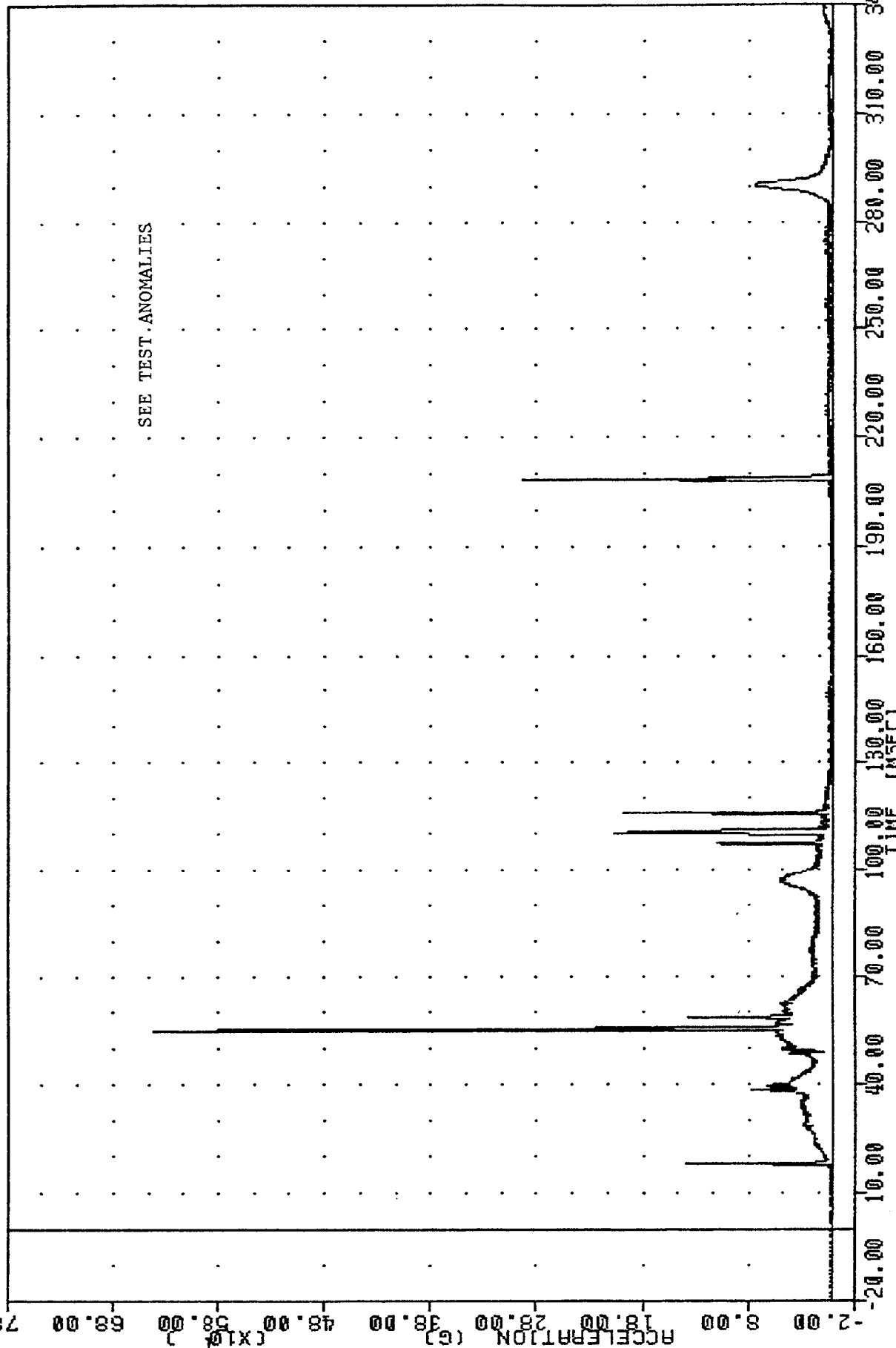
SEE TEST ANOMALIES

MYMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 PASSENGER HEAD ACCELERATION Z AXIS

TRC
NYMA SIDE IMPACT TESTING
85149000000
HEDRG2

PLOT DATE 11-JUN-85 15:23:10

FILTER = ALPF 1650/ 5217/ -40
MIN. MAX VALUES = 0.06g 12.75, 641.23 g 55.13

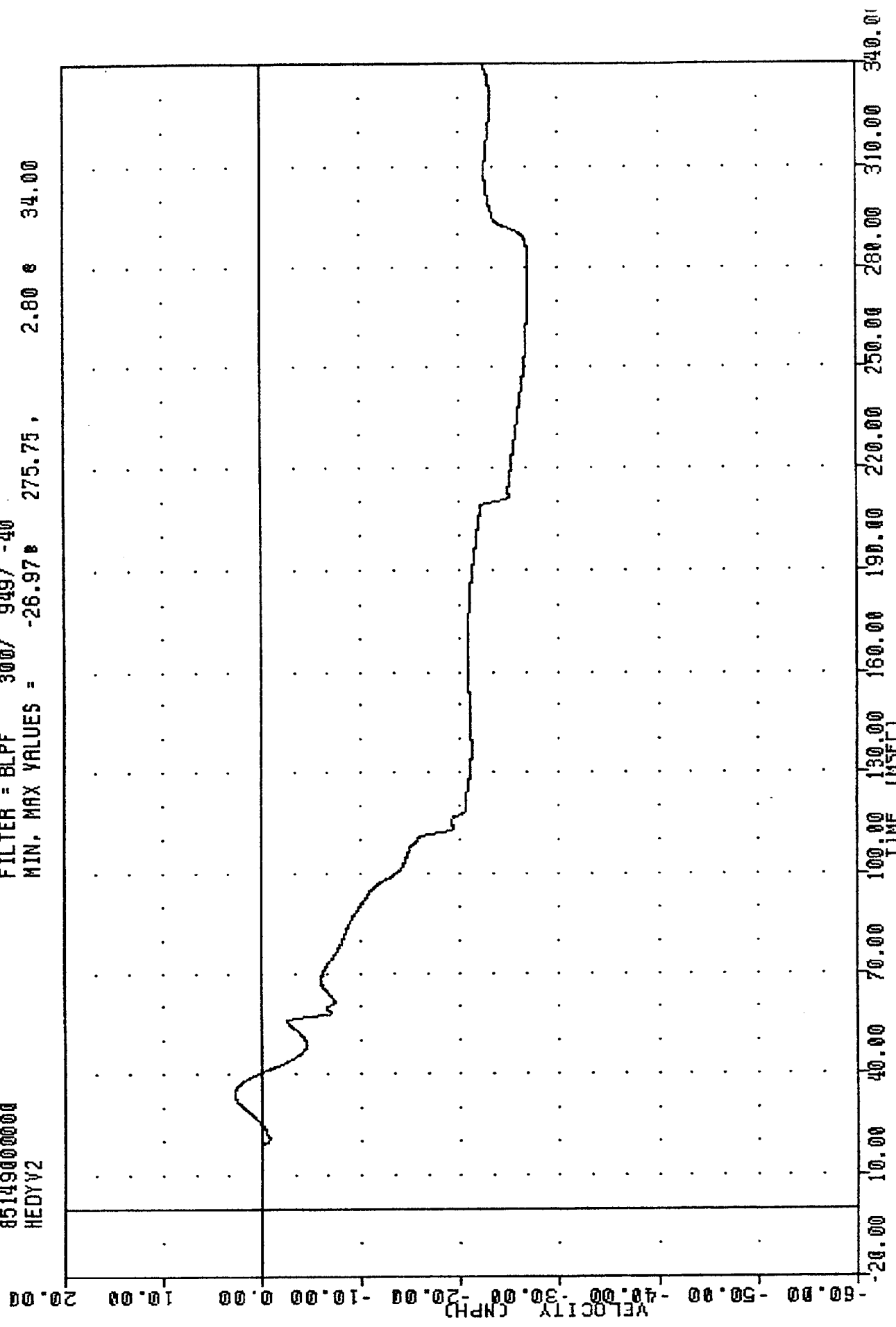


MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
PASSENGER HEAD RESULTANT ACCELERATION

TRC
 850529
 NYMA SIDE IMPACT TESTING
 85149000000
 HEDYV2

PLOT DATE 11-JUN-85 15:39:08

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -26.97 275.75 2.80 e 34.00

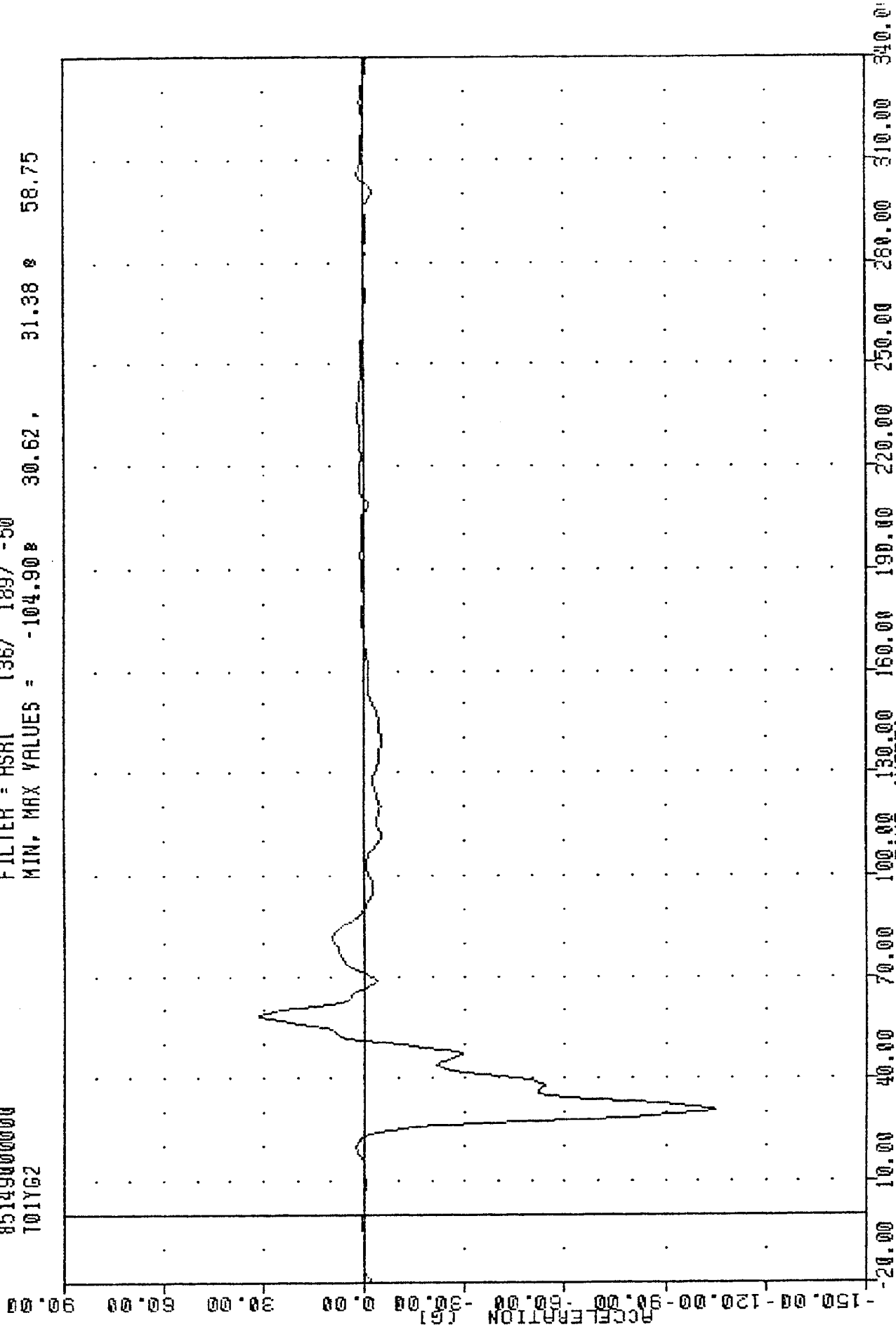


NYMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 HEAD VELOCITY Y AXIS

TRC
85149000000
T01Y6Z
NYMA SIDE IMPACT TESTING

PLOT DATE 21-JUN-85 11:19:41

FILTER = HSRI 136/ 189/ -50
MIN, MAX VALUES = -104.908 30.62, 31.38 58.75

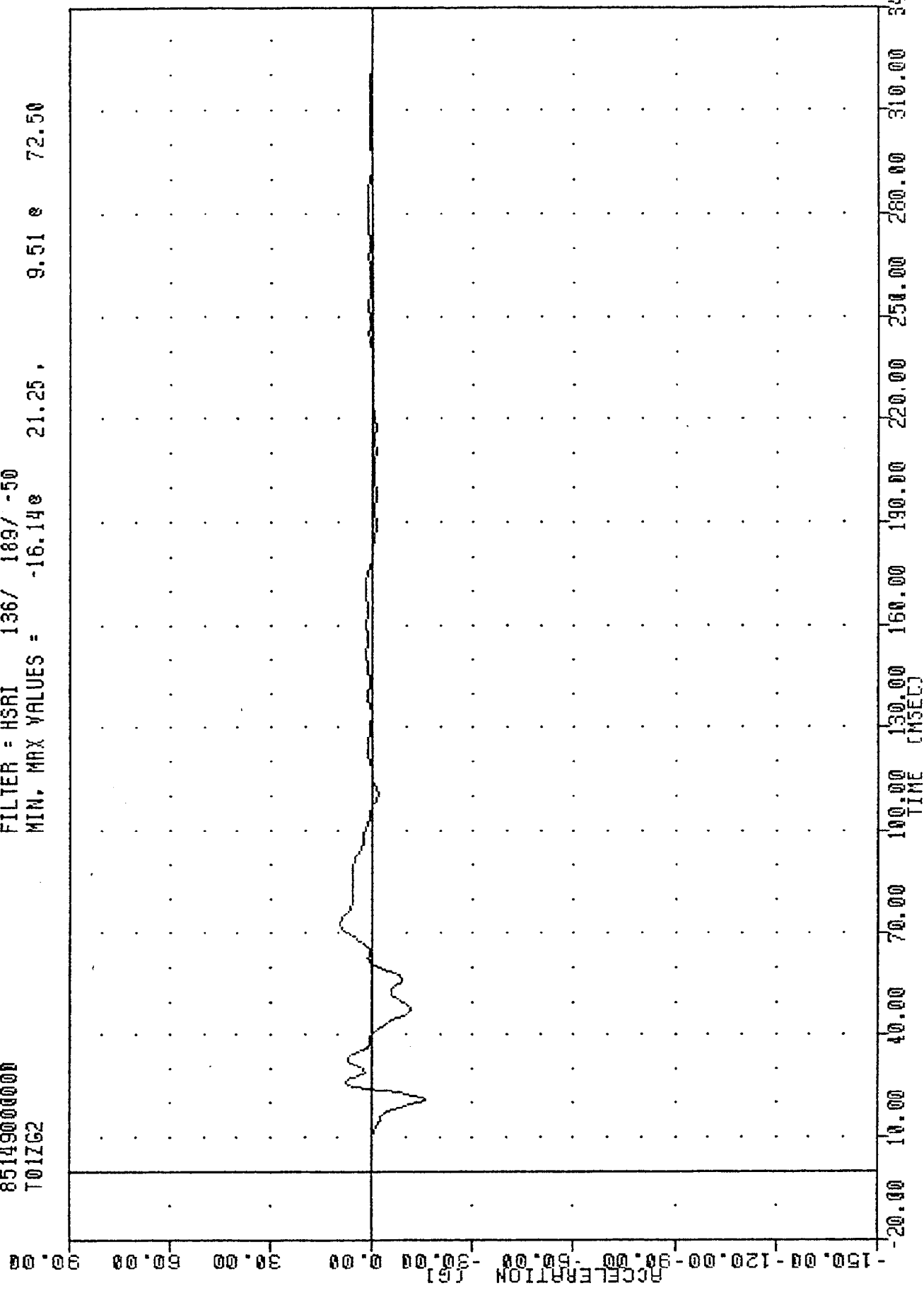


NYMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
PASSENGER UPPER SPINE ACCELERATION Y AXIS

TRC
 850529
 MYNA SIDE IMPACT TESTING
 8514900000
 T01ZG2

PLOT DATE 21-JUN-85 11:19:41

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -16.14e 21.25, 9.51 e 72.50

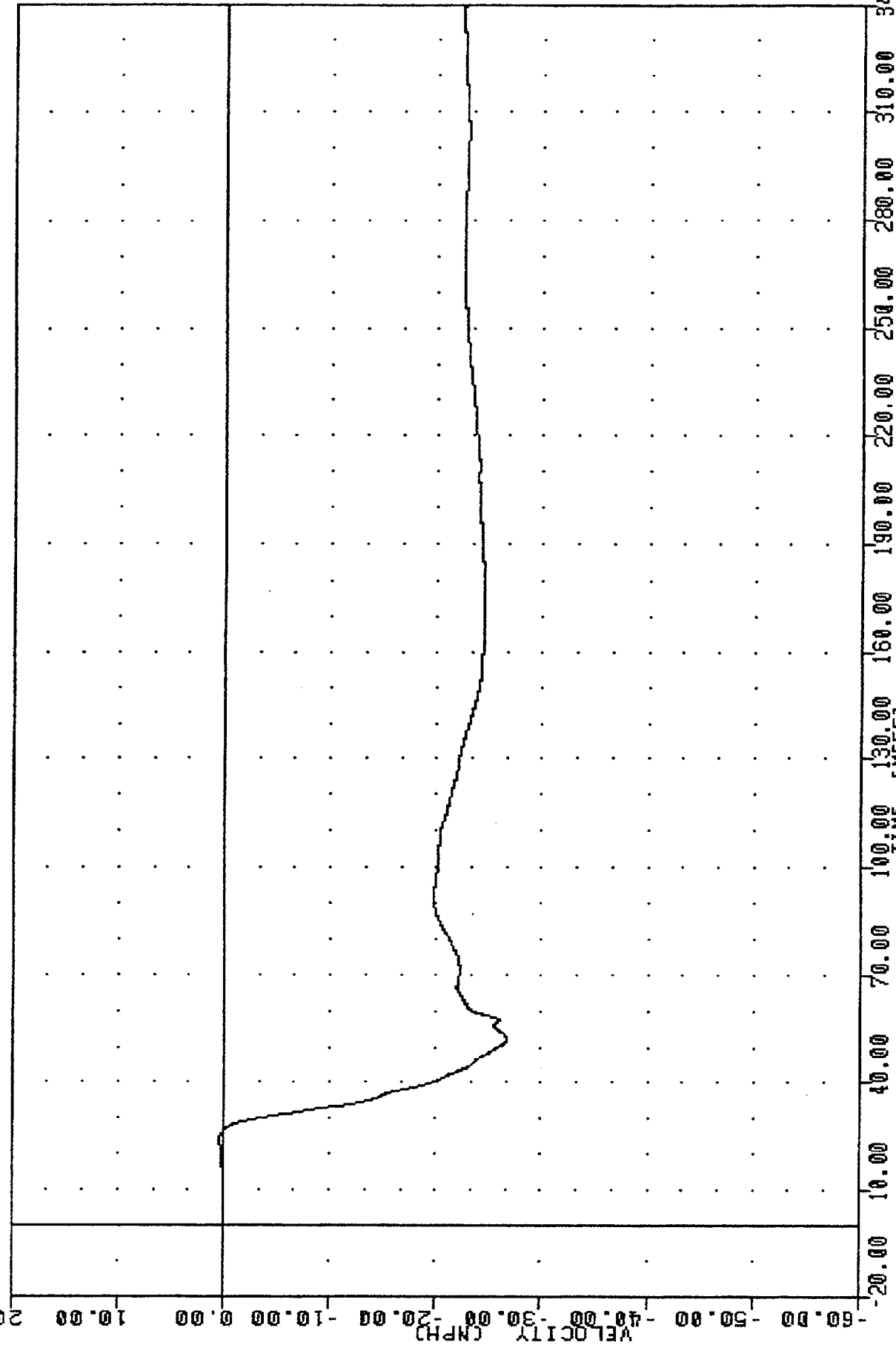


MYNA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 PASSENGER UPPER SPINE ACCELERATION Z AXIS

TRC
 850529
 MVMA SIDE IMPACT TESTING
 85149000000
 T01YV2

PLOT DATE 11-JUN-85 15:39:08

FILTER = 8LPF 300/ 949/ -10
 MIN. MAX VALUES = -26.73e 52.13, 0.41 e 24.13

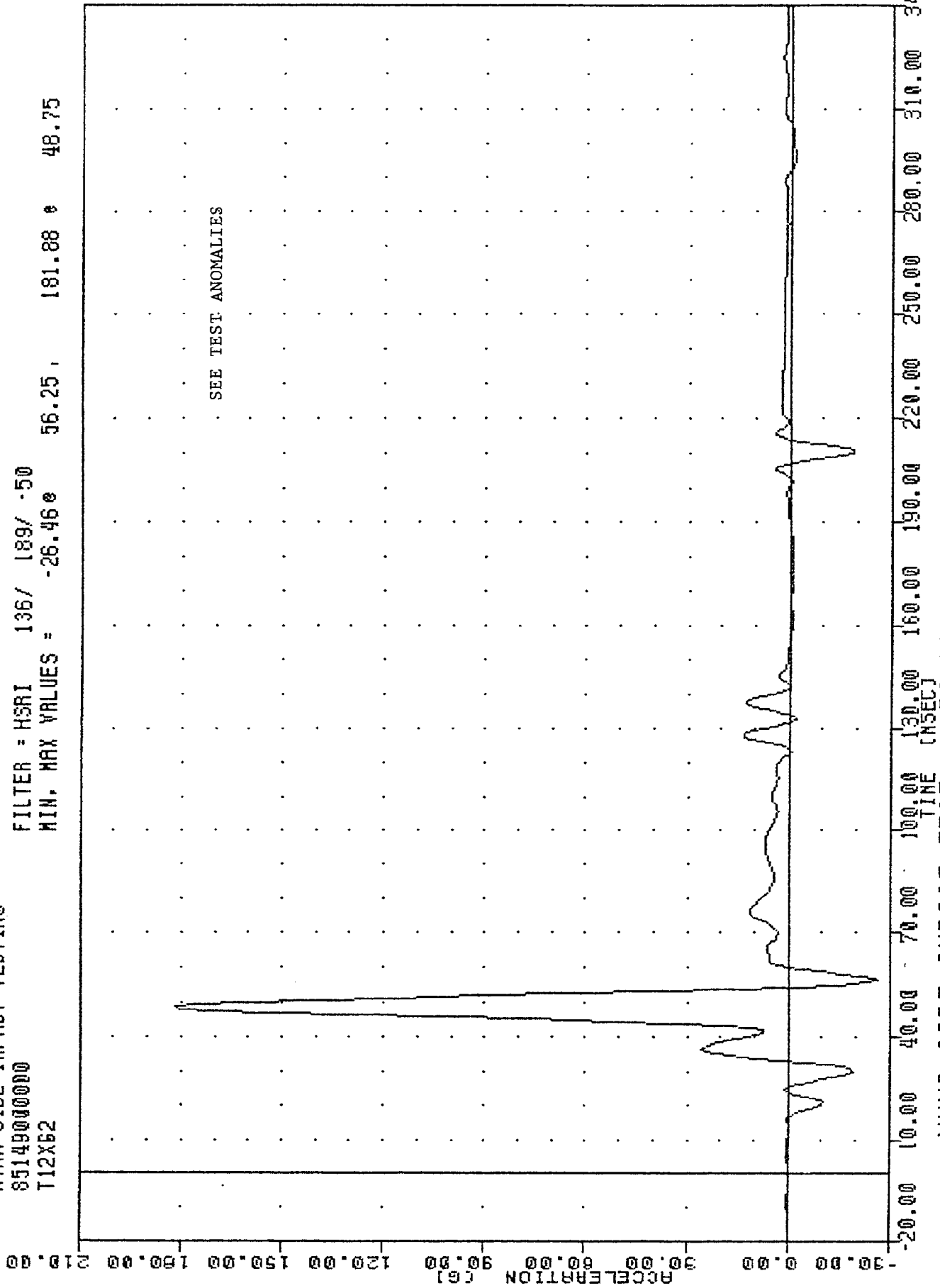


MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 UPPER SPINE VELOCITY Y AXIS

TAC
 850529
 MVMA SIDE IMPACT TESTING
 85149000000
 T12X52

PLOT DATE 21-JUN-85 11:19:41

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -26.46e 56.25, 181.88 e 48.75



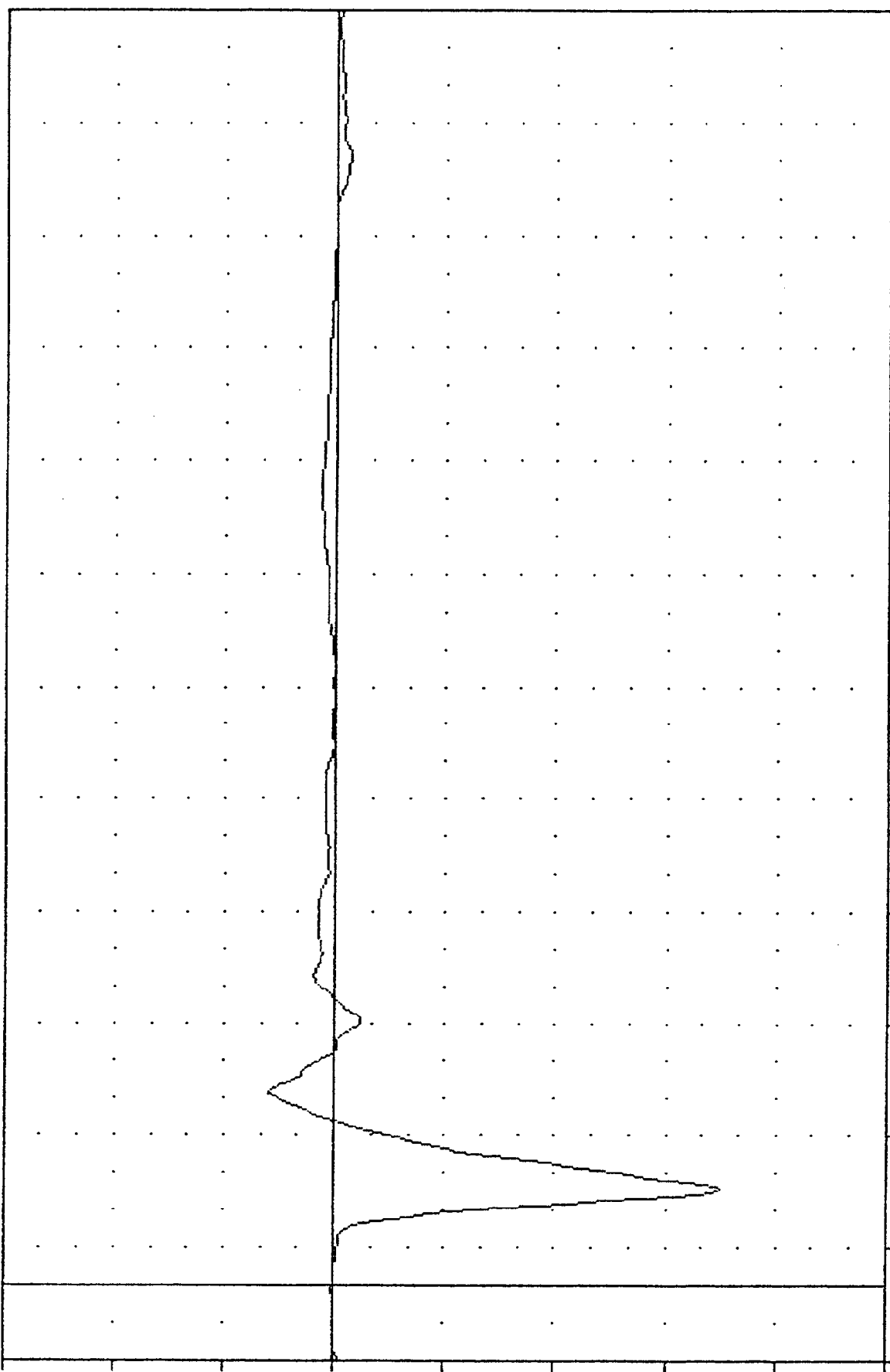
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 PASSENGER LOWER SPINE ACCELERATION X AXIS

TRC
 NYMA SIDE IMPACT TESTING
 85149000000
 T12Y62

PLOT DATE 21-JUN-85 11:19:41

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -104.89# 25.63, 17.63 # 51.88

ACCELERATION (G)
 90.00
 60.00
 30.00
 0.00
 -30.00
 -60.00
 -90.00
 -120.00
 -150.00



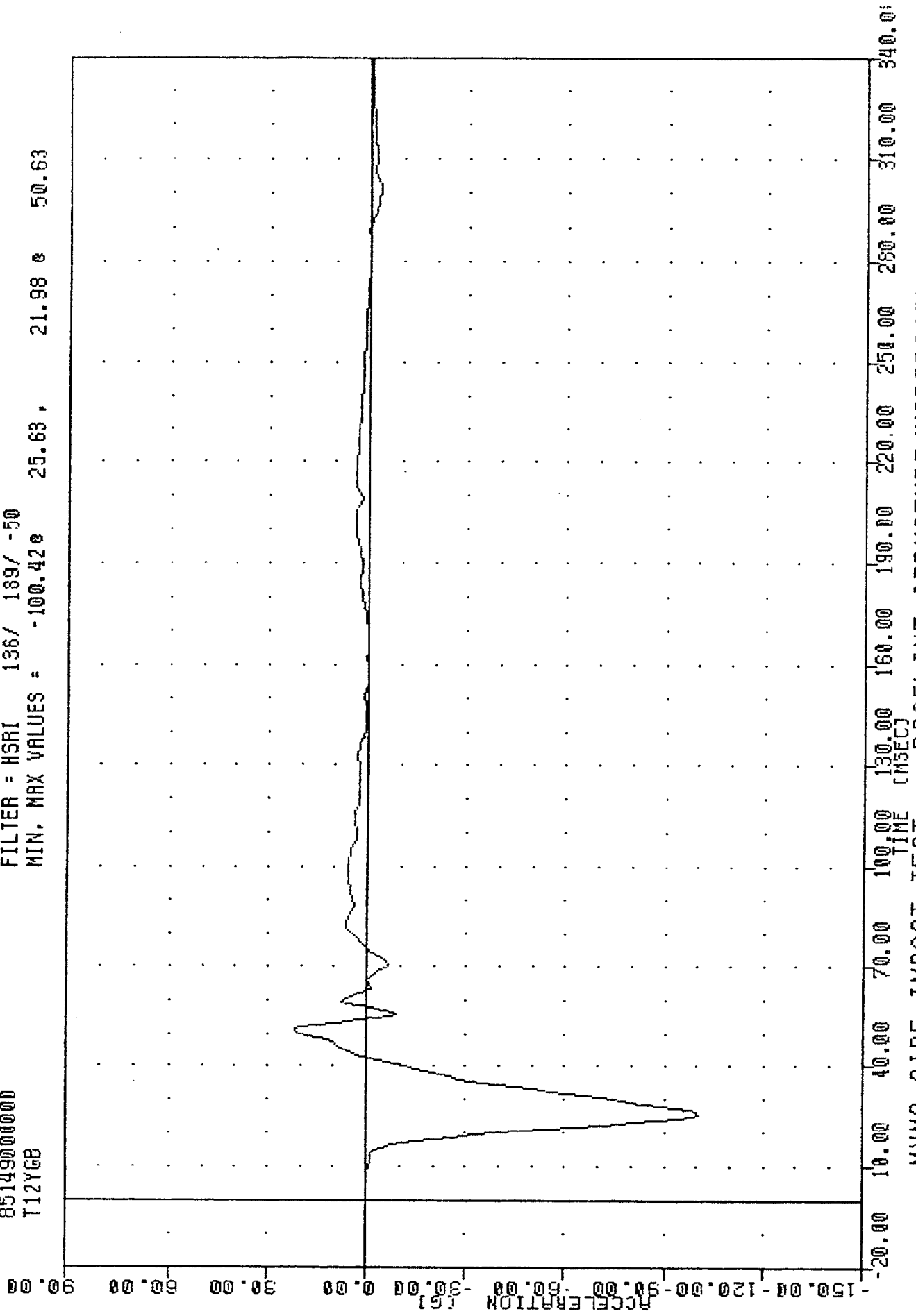
TIME (MSEC)
 -20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

NYMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 PASSENGER LOWER SPINE ACCELERATION Y AXIS

TRC
 , 850529
 MVMA SIDE IMPACT TESTING
 85149000000
 T12YGB

PLOT DATE 21-JUN-85 11:19:41

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -100.428 25.63 , 21.98 & 50.63

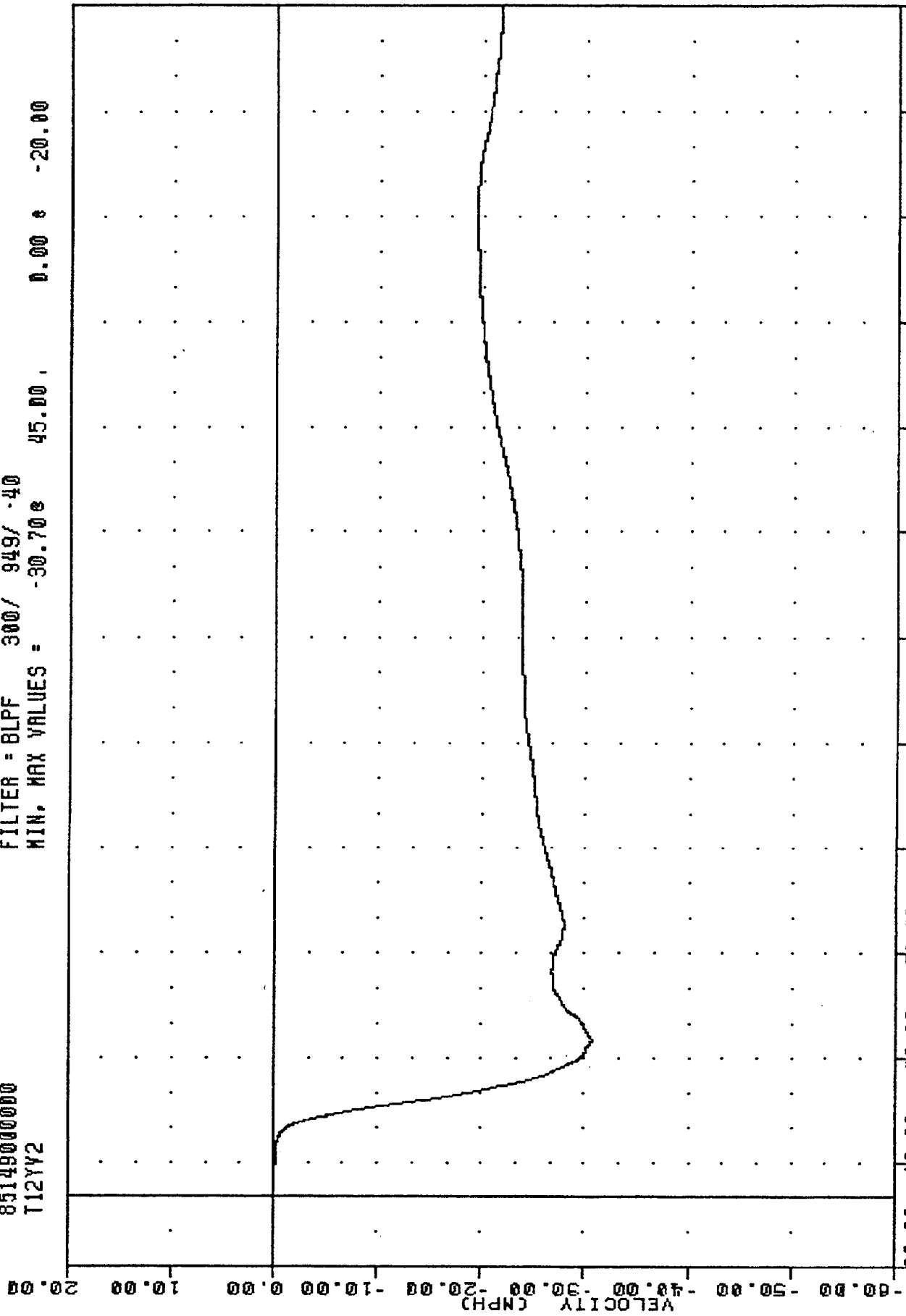


MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 PASSENGER LOWER SPINE ACCELERATION - Y AXYS

THC
850529
MVMA SIDE IMPACT TESTING
8514900000
T12YV2

PLOT DATE 11-JUN-85 15:39:08

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -30.70e 45.00, 0.00 e -20.00

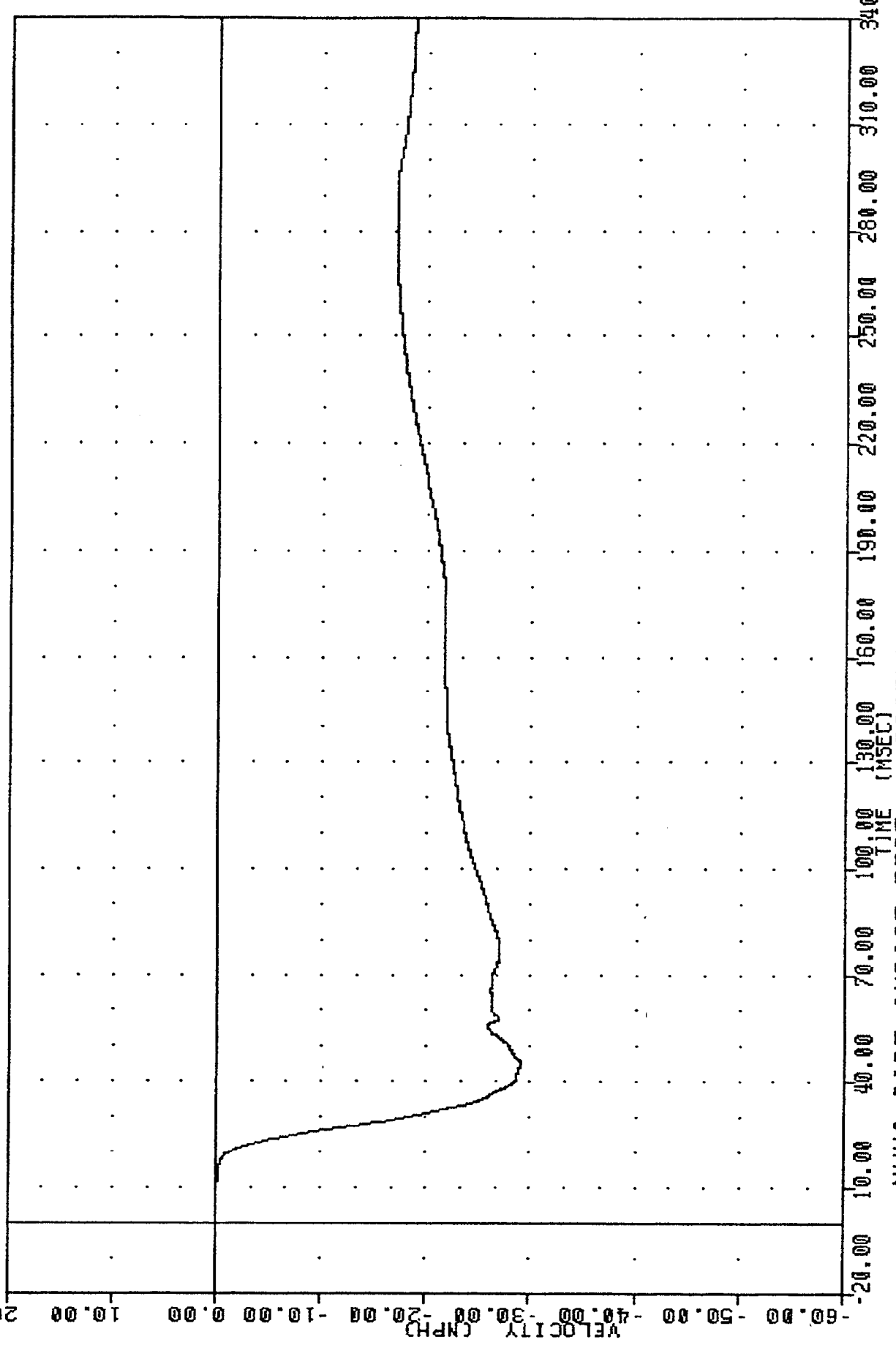


60.00 50.00 40.00 30.00 20.00 10.00 0.00 -10.00 -20.00 -30.00 -40.00 -50.00 -60.00
TIME (MSEC) 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
LOWER SPINE VELOCITY Y AXIS

TRC 850529
 NYMA SIDE IMPACT TESTING
 8514900000
 T12YVB

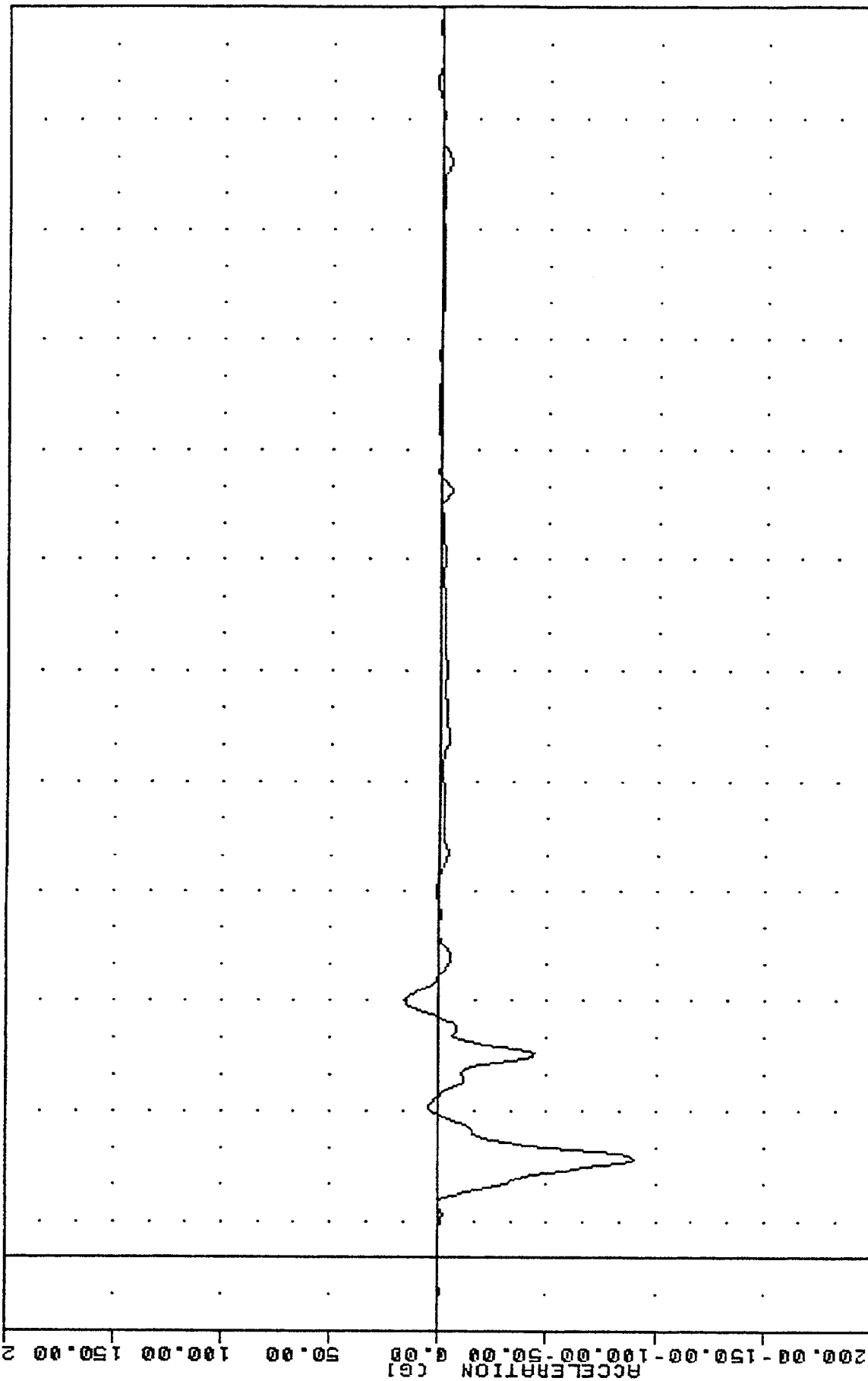
PLOT DATE 11-JUN-85 15:39:08

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -29.14 44.88 0.00 e -20.00



NYMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 LOWER SPINE VELOCITY -2 Y AXIS

7 830529
 MVMA SIDE IMPACT TESTING
 85149000000
 RURY62
 FILTER = HSRI 136/ 189/ .50
 MIN, MAX VALUES = -90.22e 26.87, 15.61 e 70.00
 PLOT DATE 11-JUN-85 15:35:23

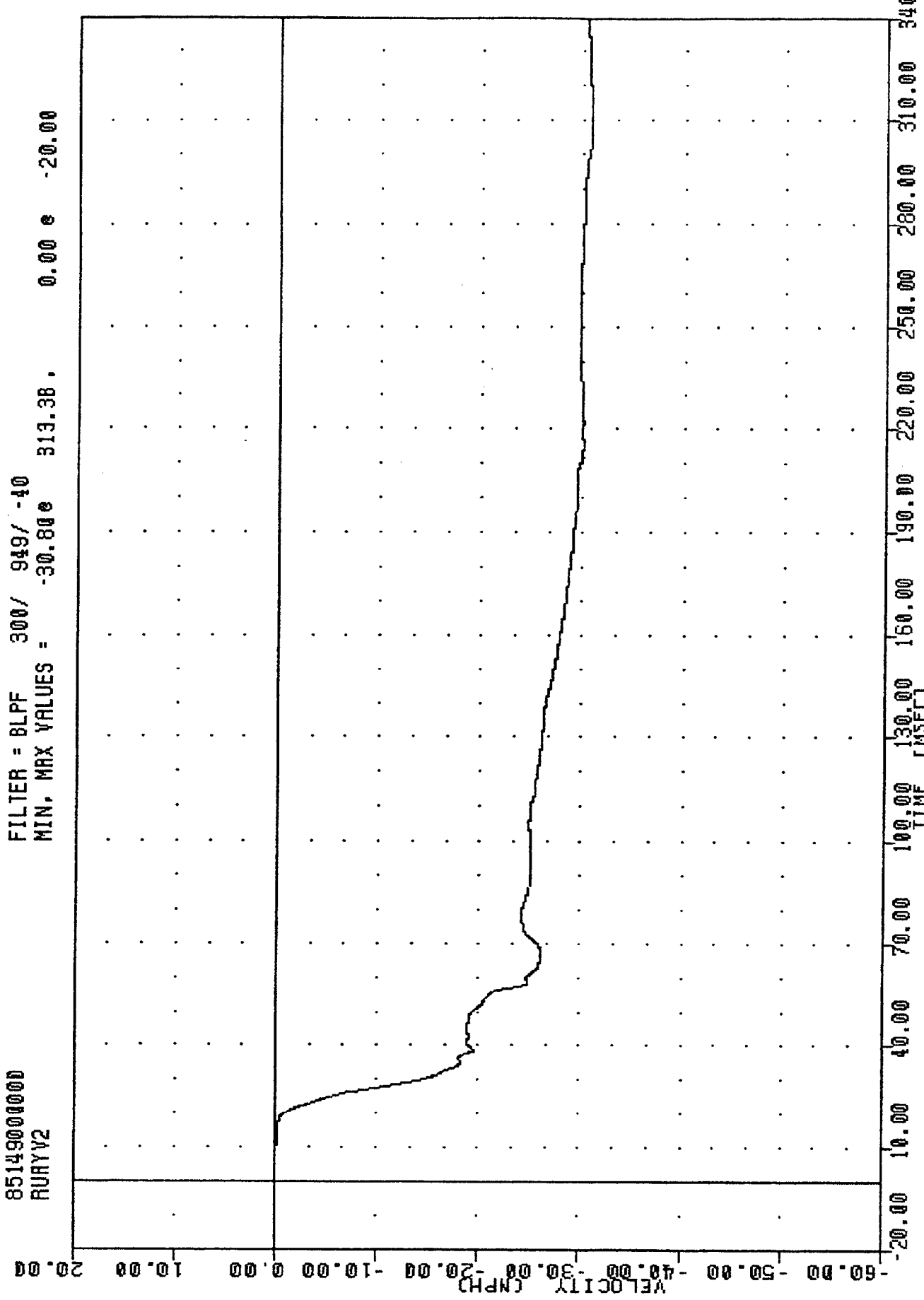


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)
 MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 PASSENGER RIGHT UPPER RIB ACCELERATION Y AXIS

INC 850529
 MVMA SIDE IMPACT TESTING
 8514900000
 RURYV2

PLOT DATE 11-JUN-85 15:39:08

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -30.80e 313.38. 0.00 e -20.00

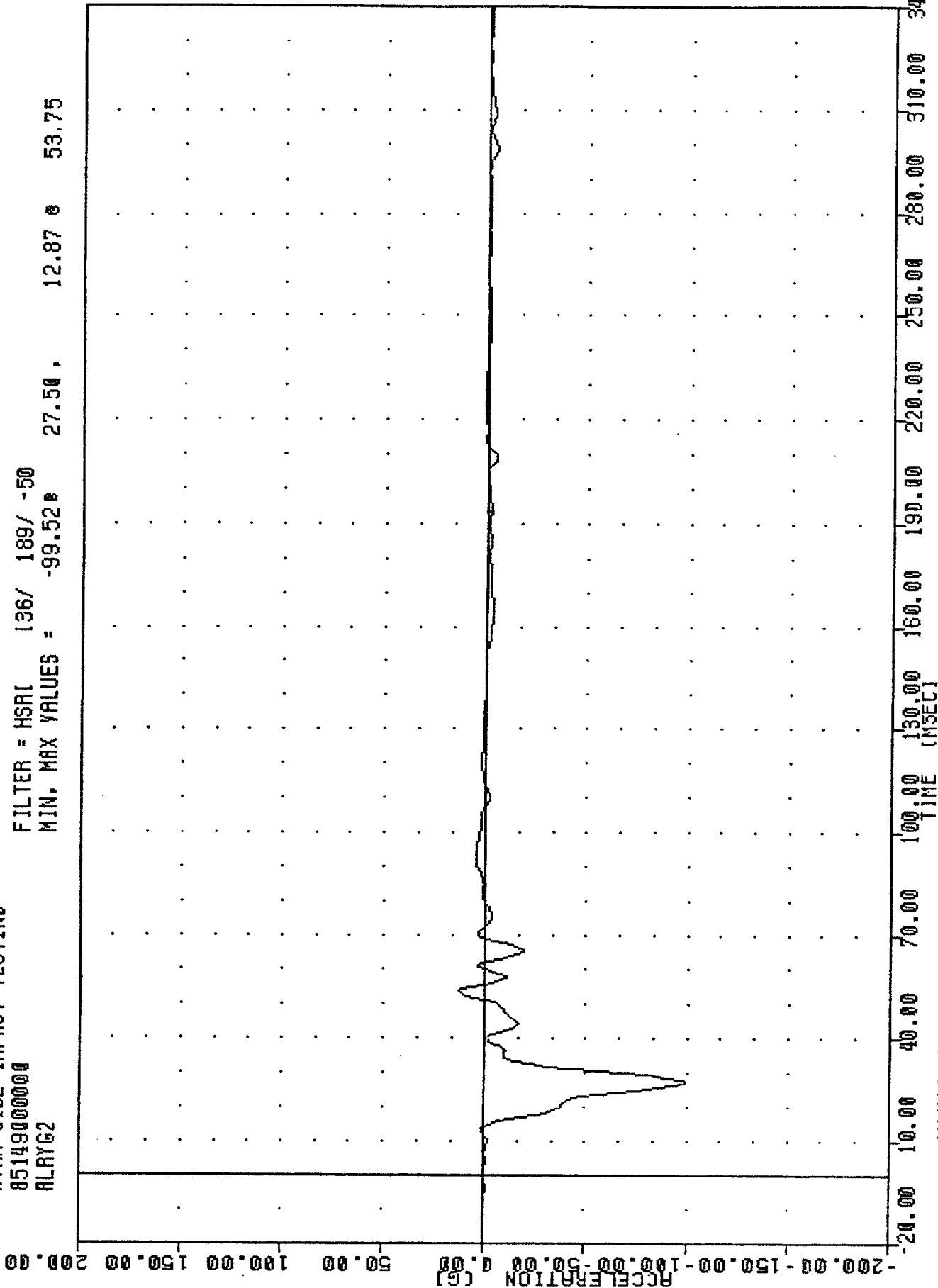


MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 RIGHT UPPER RIB VELOCITY Y AXIS

TMC
 NVMA SIDE IMPACT TESTING
 85149000000
 ALRYG2

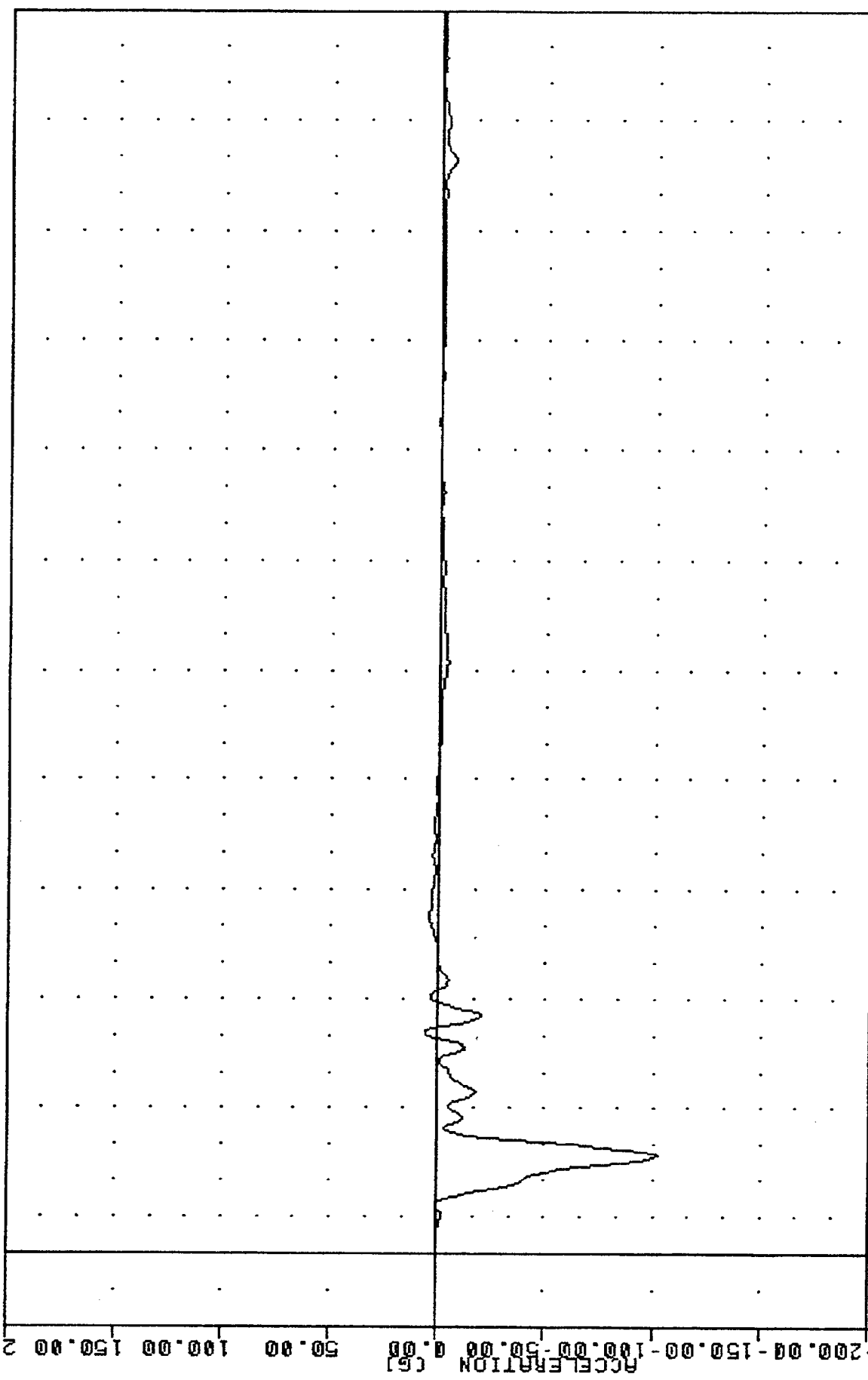
PLOT DATE 17-JUN-85 15:35:23

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -99.52 27.50 12.87 53.75



NVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 PASSENGER RIGHT LOWER RIB ACCELERATION Y AXIS

TRC 850529
 MYMA SIDE IMPACT TESTING
 85149000000
 RLYGB
 PLOT DATE 11-JUN-85 15:35:23
 FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -102.57e 26.87, 6.08 e 60.62

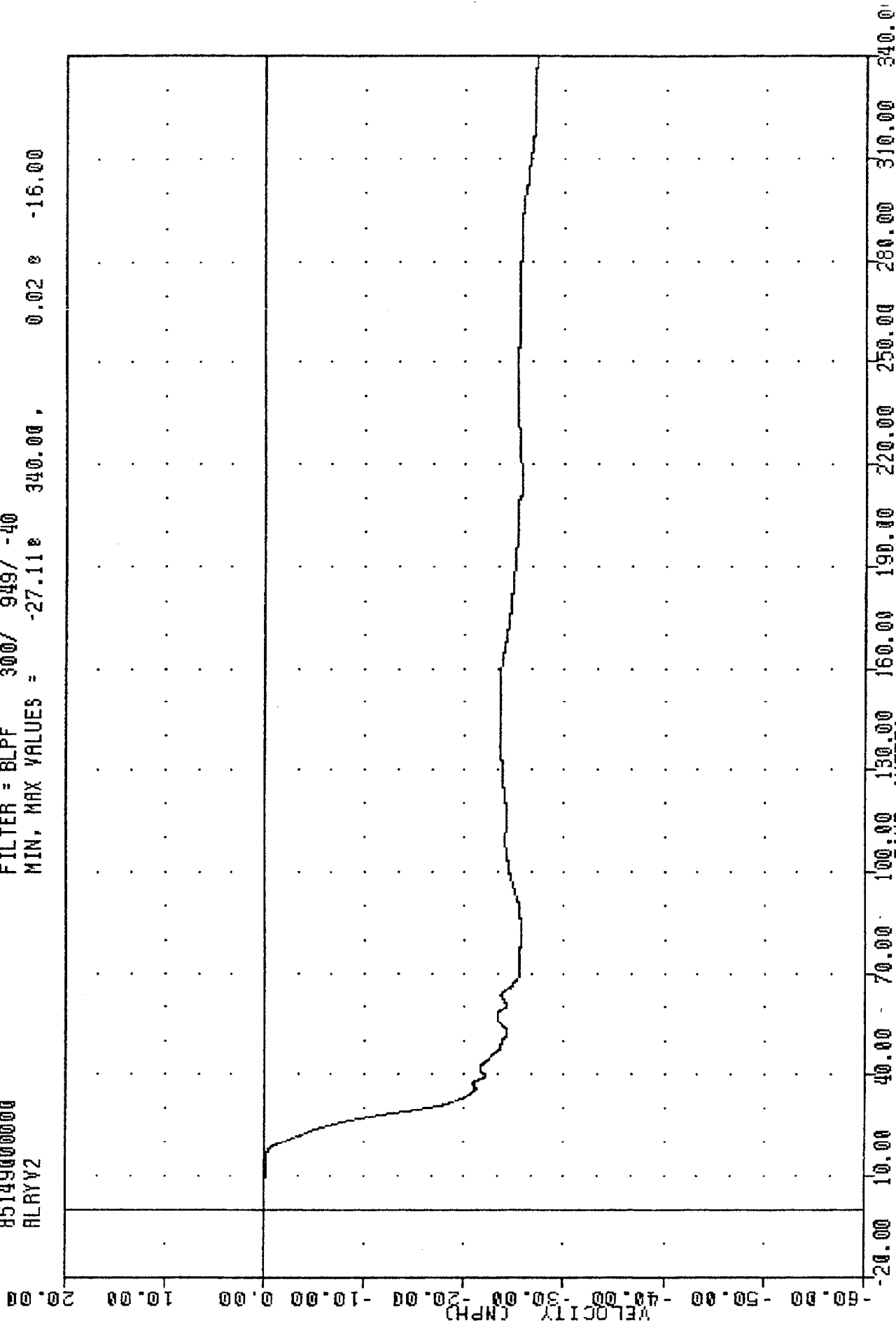


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)
 MYMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 PASSENGER RIGHT LOWER RIB ACCELERATION -2 Y AXIS

TRC
 MVMA SIDE IMPACT TESTING
 8514900000
 ALRYV2

PLOT DATE 21-JUN-85 12:51:28

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -27.11e 340.00, 0.02 e -16.00

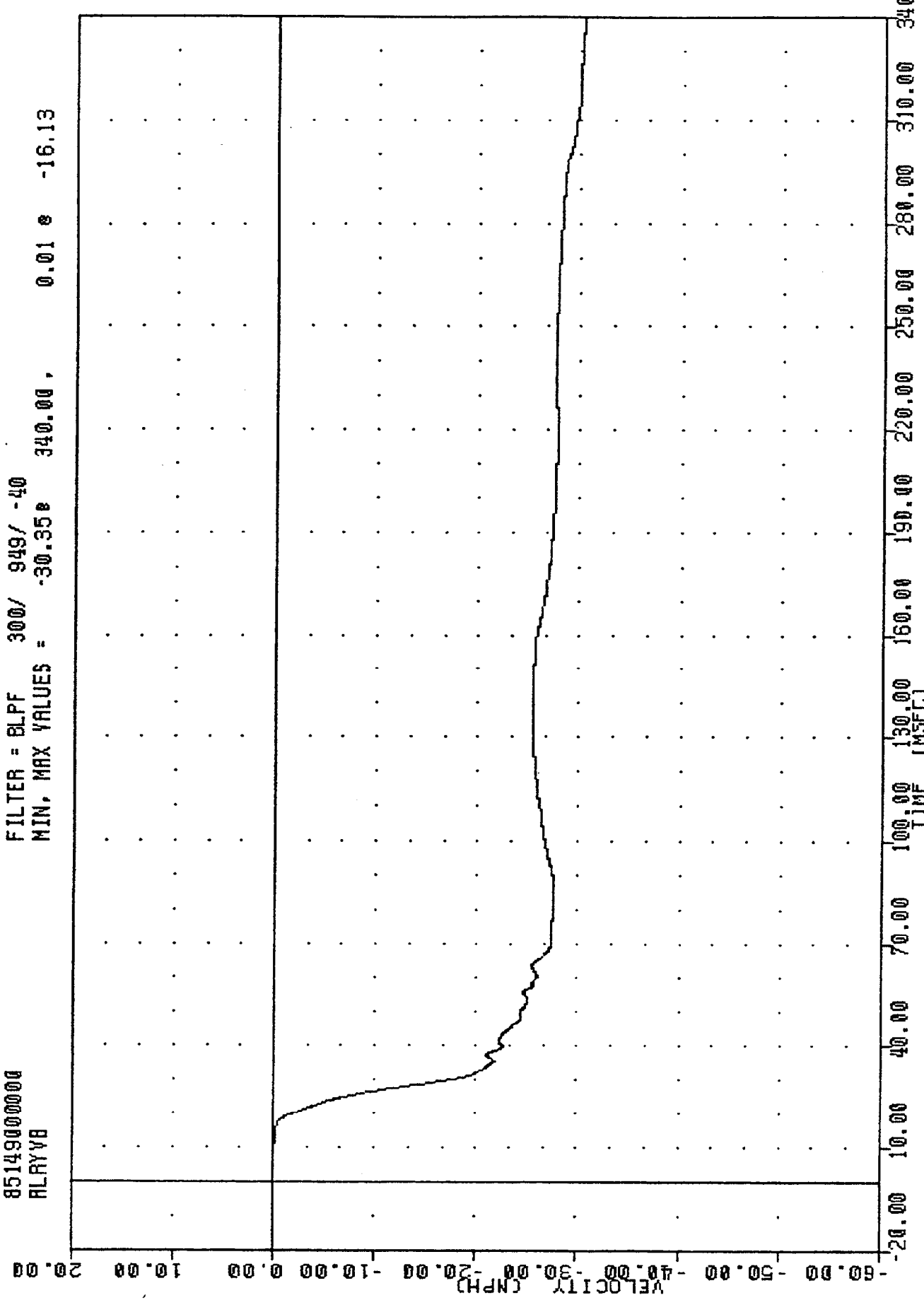


MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 RIGHT LOWER RTR VFINCITY Y AXIS

7050529
 NYMA SIDE IMPACT TESTING
 85149000000
 ALRYVB

PLOT DATE 11-JUN-85 15:39:08

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -30.35e 340.00, 0.01 e -16.13



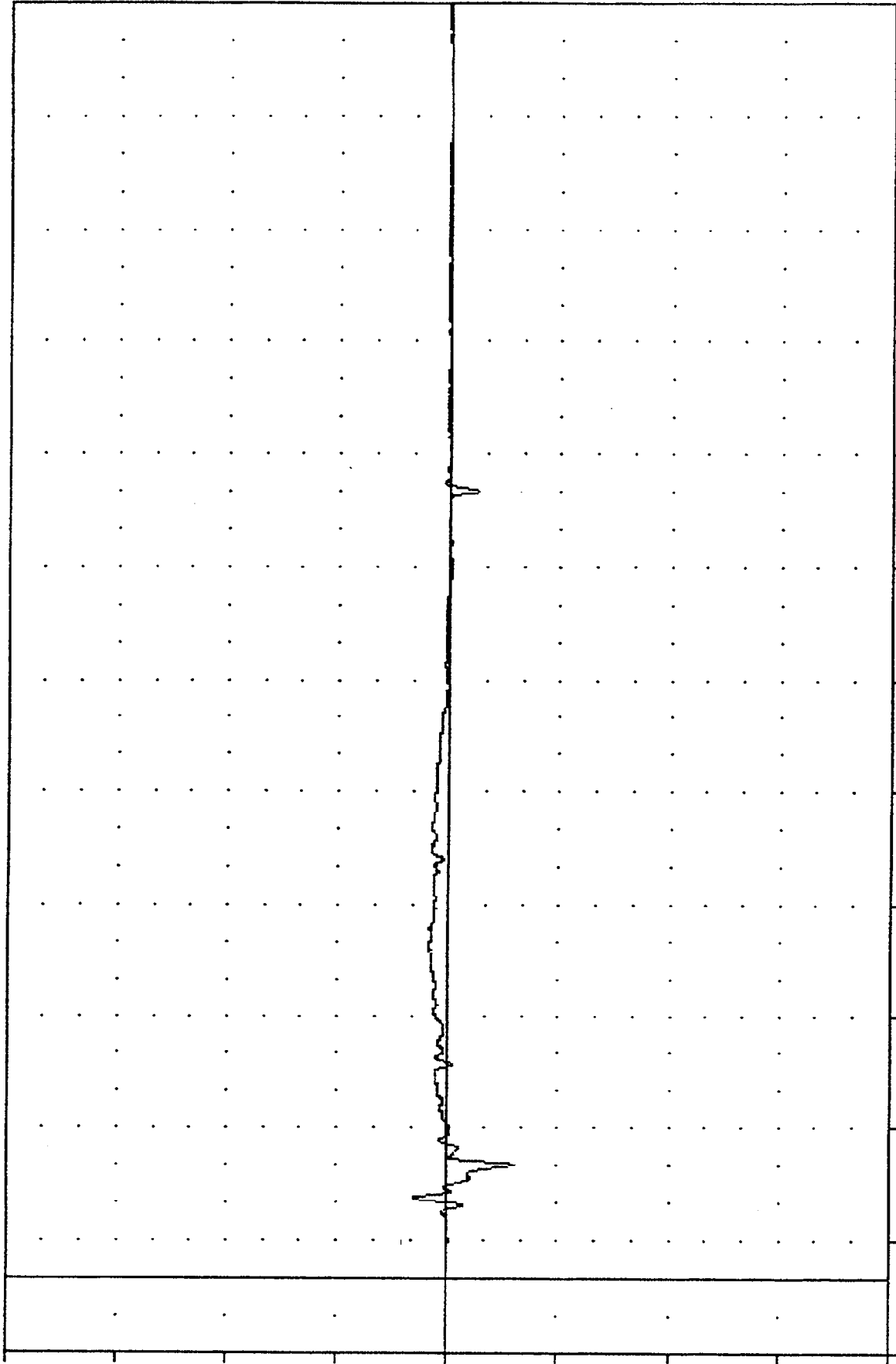
NYMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 RIGHT LOWER RIB VELOCITY -2 Y AXIS

INC 850529
NVMA SIDE IMPACT TESTING
85149000000
PEVXG2

PLUT DATE 13-JUN-85 09:27:31

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -30.04 e 30.13, 15.10 e 21.13

ACCELERATION (G)
-200.00 -150.00 -100.00 -50.00 0.00 50.00 100.00 150.00 200.00



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
TIME (MSEC)

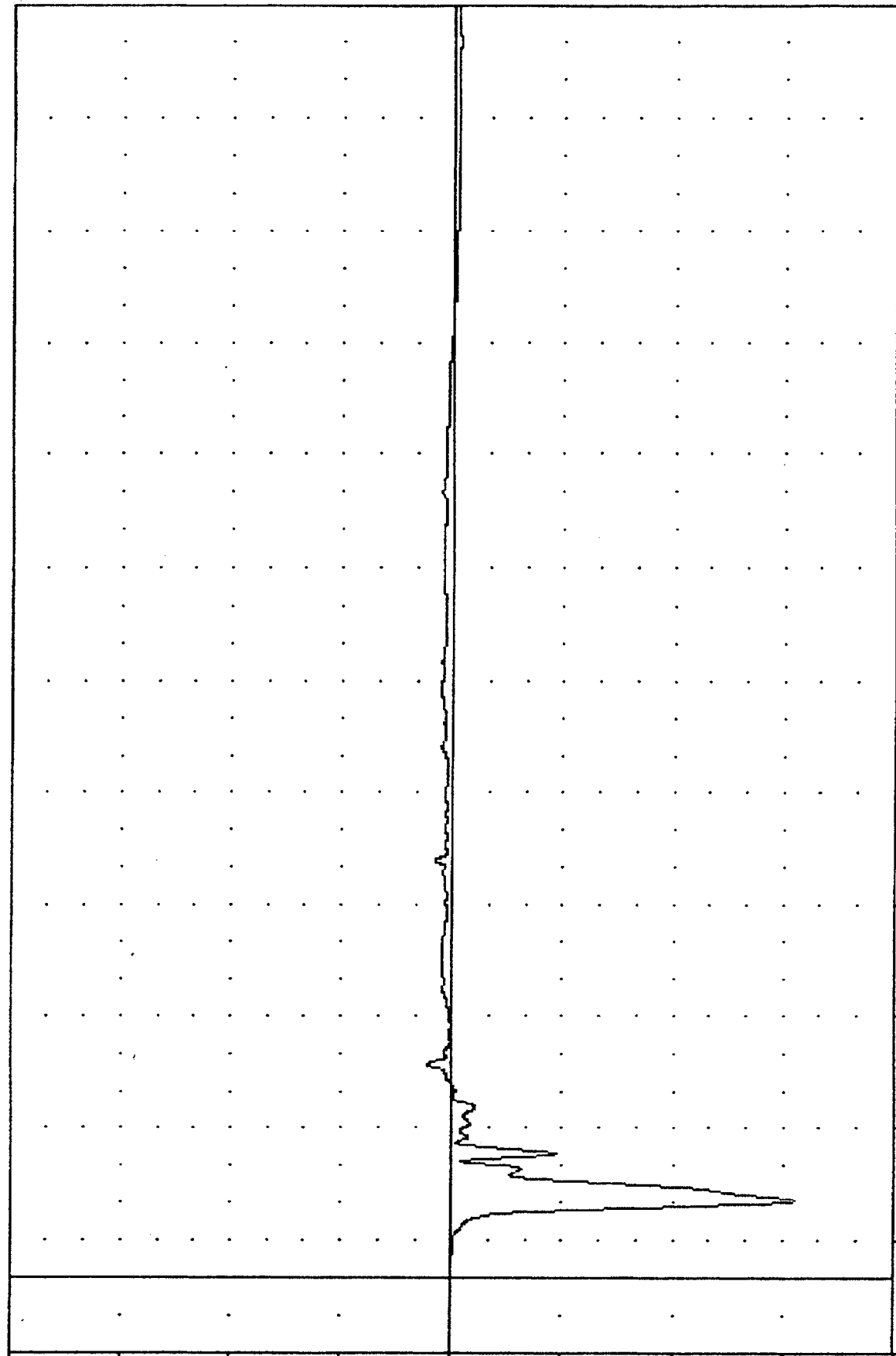
MYMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
PASSENGER PELVIS ACCELERATION X AXIS

TRC
 850529
 MVMA SIDE IMPACT TESTING
 85149000000
 PEYCG2

PLOT DATE 19-JUN-85 09:27:31

FILTER = 8LPF 300/ 919/ -10
 MIN, MAX VALUES = -155.65e 20.63, 10.85 e 57.00

ACCELERATION (G)
 -200.00 -150.00 -100.00 -50.00 0.00 50.00 100.00 150.00 200.00



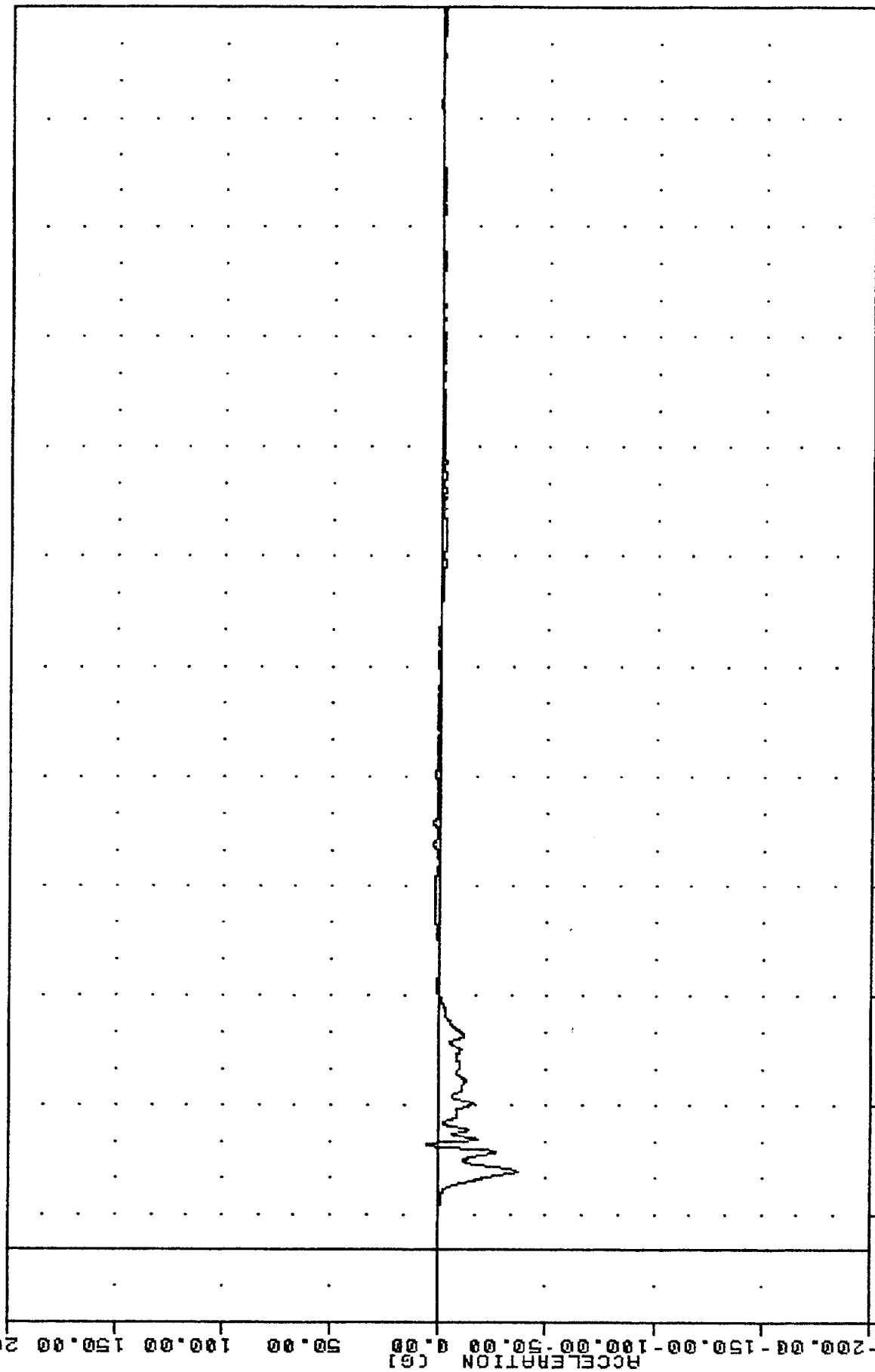
TIME (MSEC)
 -20.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00

MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 PASSENGER PELVIS ACCELERATION Y AXIS

TRC
 850529
 MVMA SIDE IMPACT TESTING
 8514900000
 PEVZ62

PLUT DATE 13-JUN-85 09:27:31

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -36.48 21.63 5.75 29.00



-200.00 -150.00 -100.00 -50.00 0.00 50.00 100.00 150.00 200.00
 ACCELERATION (G)

10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00
 TIME (MSEC)

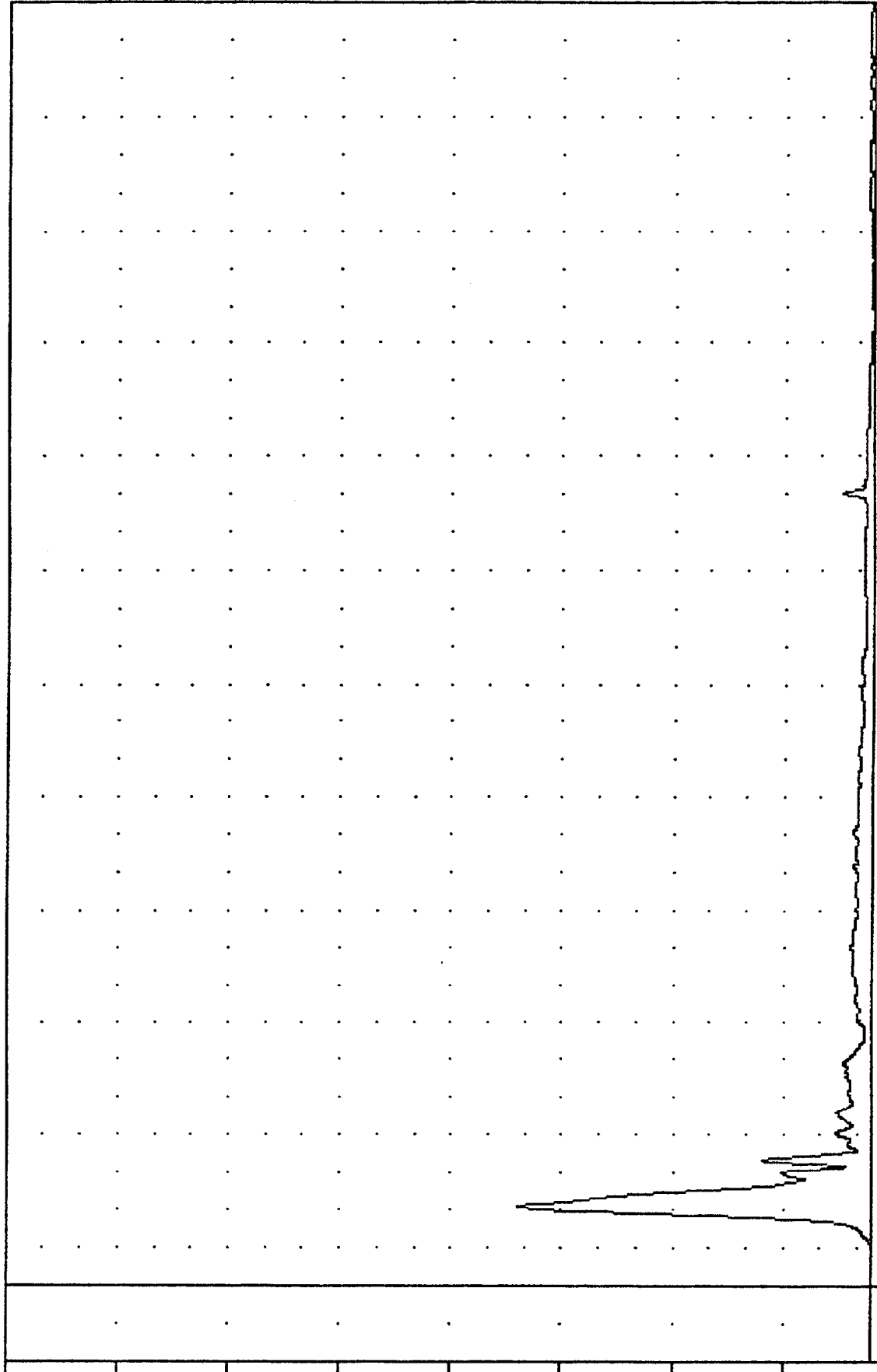
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 PASSENGER PELVIS ACCELERATION Z AXIS

TRC
850529
MVMA SIDE IMPACT TESTING
8514900000
PEVRG2

PLOT DATE 13-JUN-85 09:27:31

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = 0.068 -11.63, 159.39 & 20.75

ACCELERATION (G)
-10.00 40.00 90.00 140.00 190.00 240.00 290.00 340.00 390.00

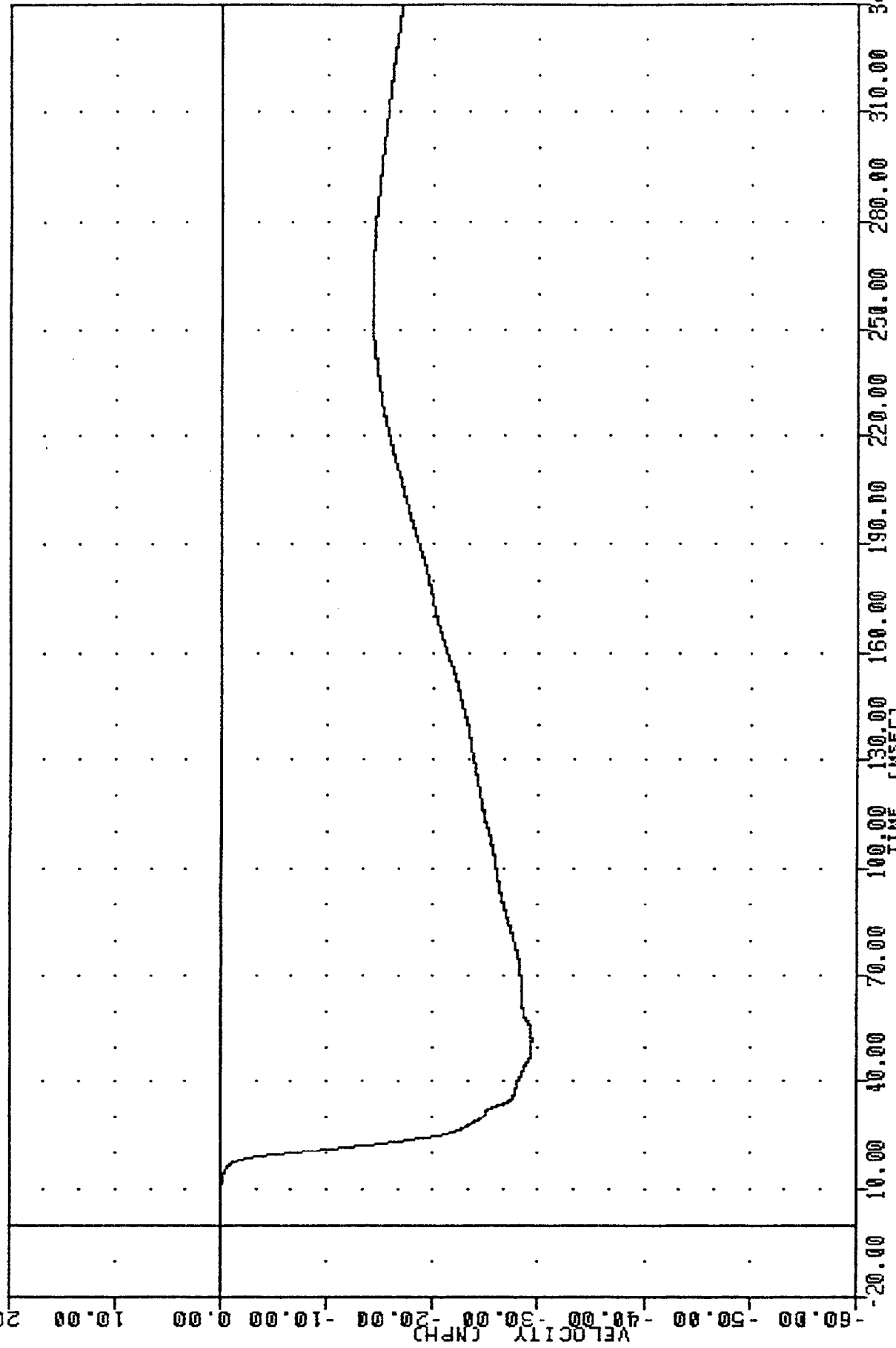


-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
TIME (MSEC)

MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
PASSENGER PELVIS RESULTANT ACCELERATION

TRC 850529 11-JUN-85 15:39:08
 MYNA SIDE IMPACT TESTING
 85149000000
 PEYY2

FILTER = BLPF 300/ 919/ -10
 MIN, MAX VALUES = -29.39e 51.88. 0.00 e -20.00

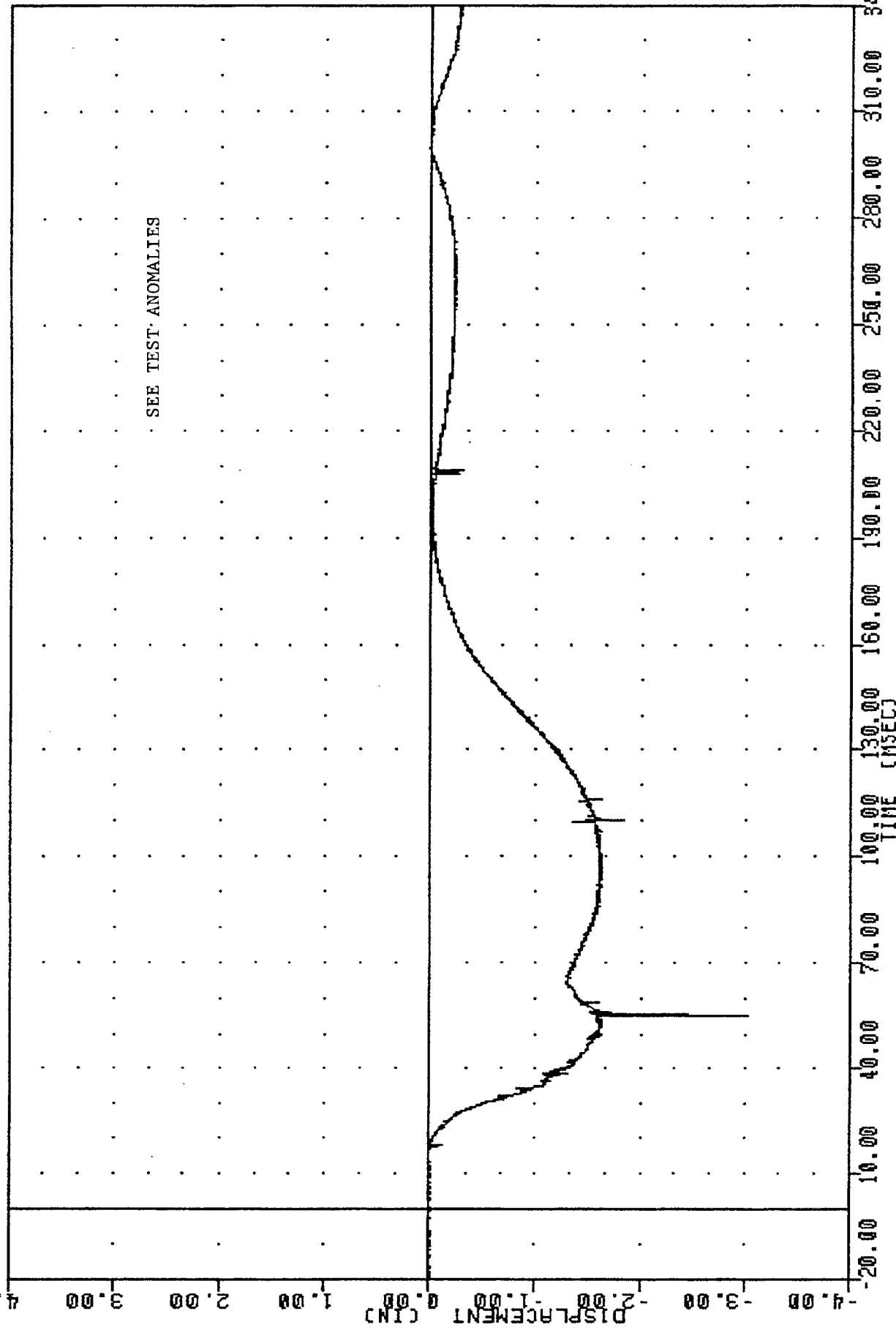


MYNA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 PELVIS VELOCITY Y AXIS

TRC
 850529
 MVNA SIDE IMPACT TESTING
 8514900000
 RRTYD2

PLUT DATE 11-JUN-85 15:23:10

FILTER = ALPF 1650/ 5217/ -40
 MIN, MAX VALUES = -3.02e 55.13, 0.02 e 299.38

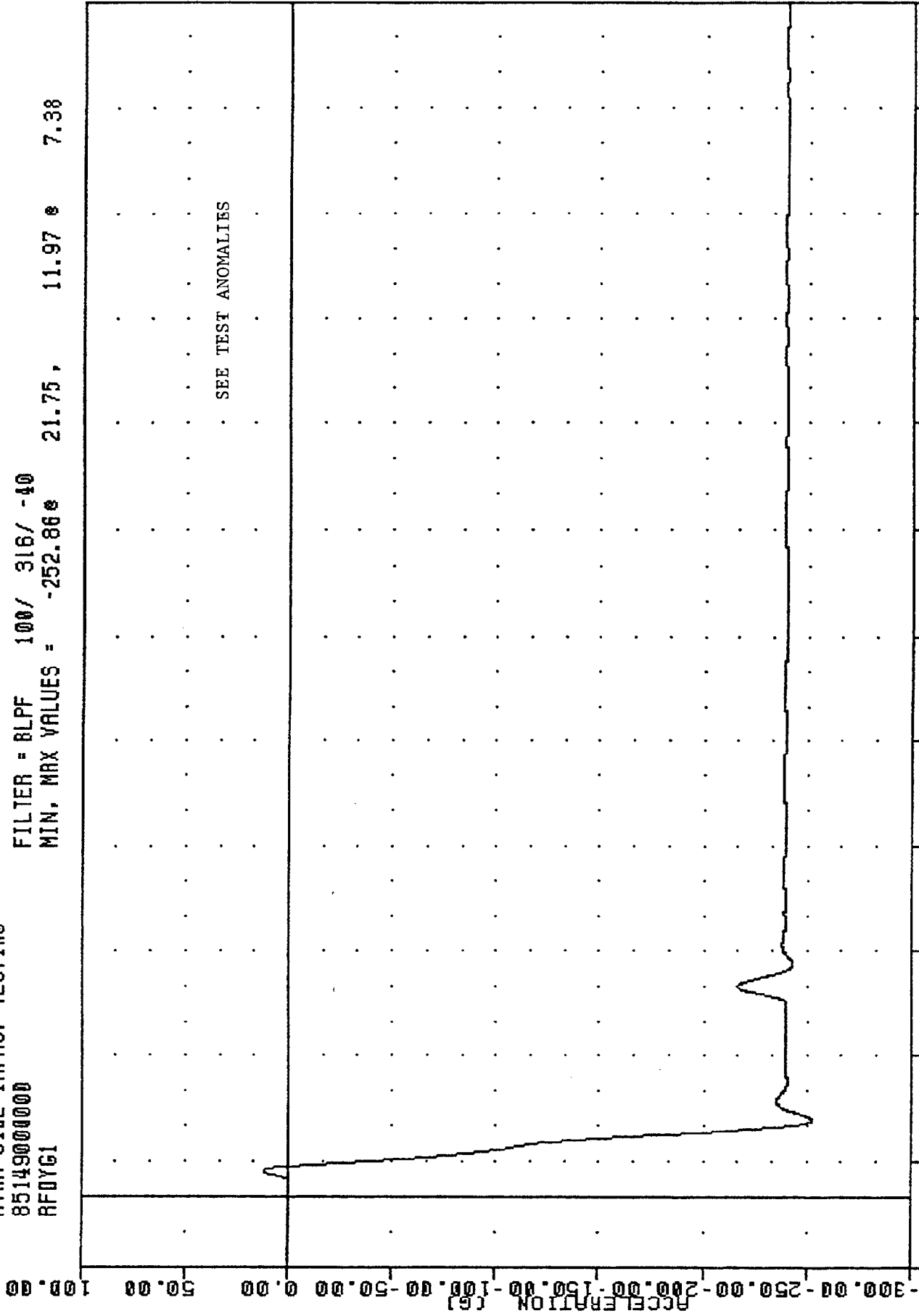


MVNA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 PASSENGER RIGHT RIB TO SPINE DISPLACEMENT INCHES

TRC
 850529
 MVMA SIDE IMPACT TESTING
 85149000000
 RFOYGI

PLOT DATE 11-JUN-85 15:23:10

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -252.86e 21.75, 11.97 e 7.38



SEE TEST ANOMALIES

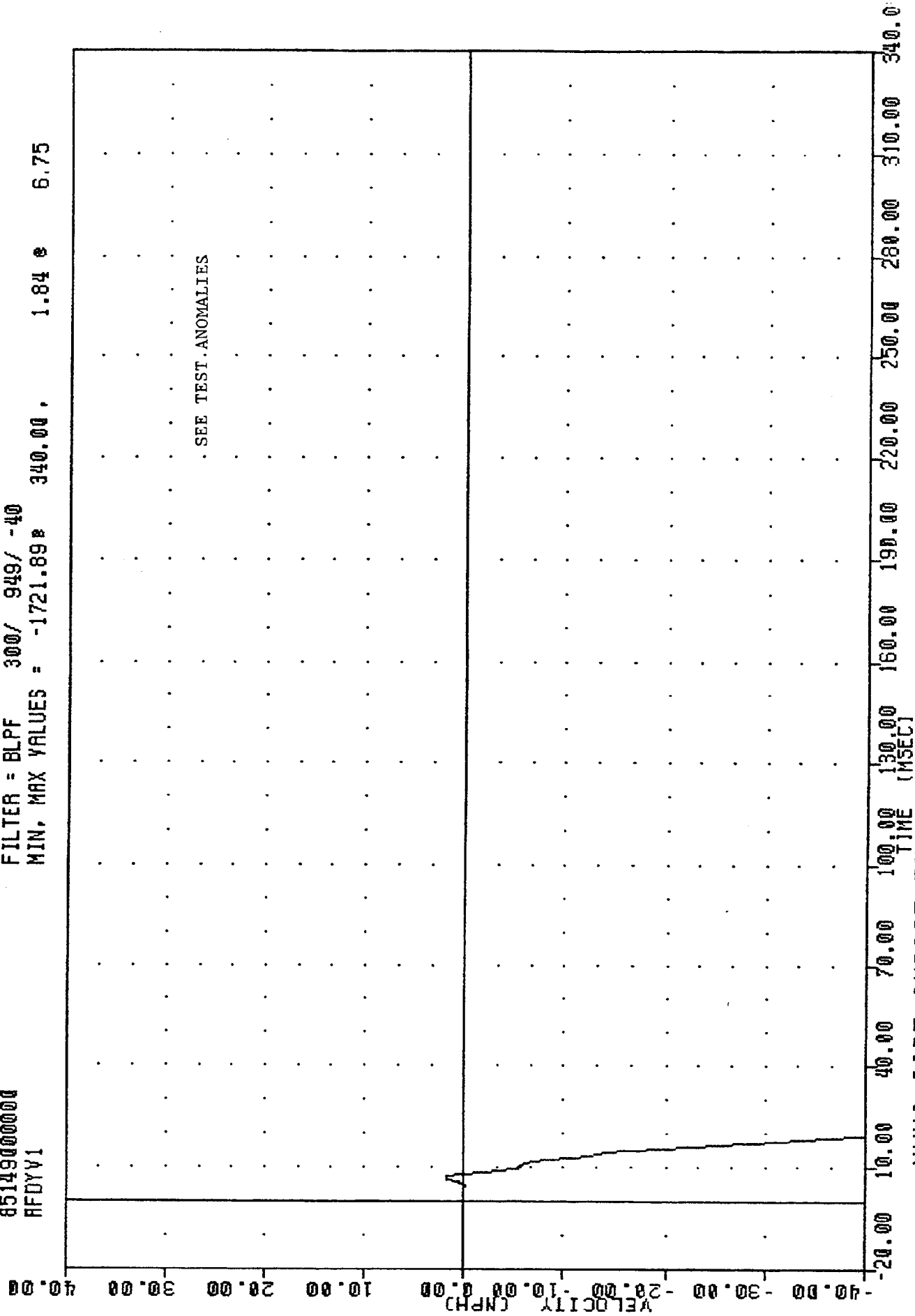
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)

MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 VEHICLE RIGHT FRONT DOOR (POSITION 1) ACCELERATION Y AXIS

TRC
 NYMA SIDE IMPACT TESTING
 85149000000
 AFDYV1

PLOT DATE 11-JUN-85 15:39:08

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -1721.89* 340.00, 1.84 e 6.75

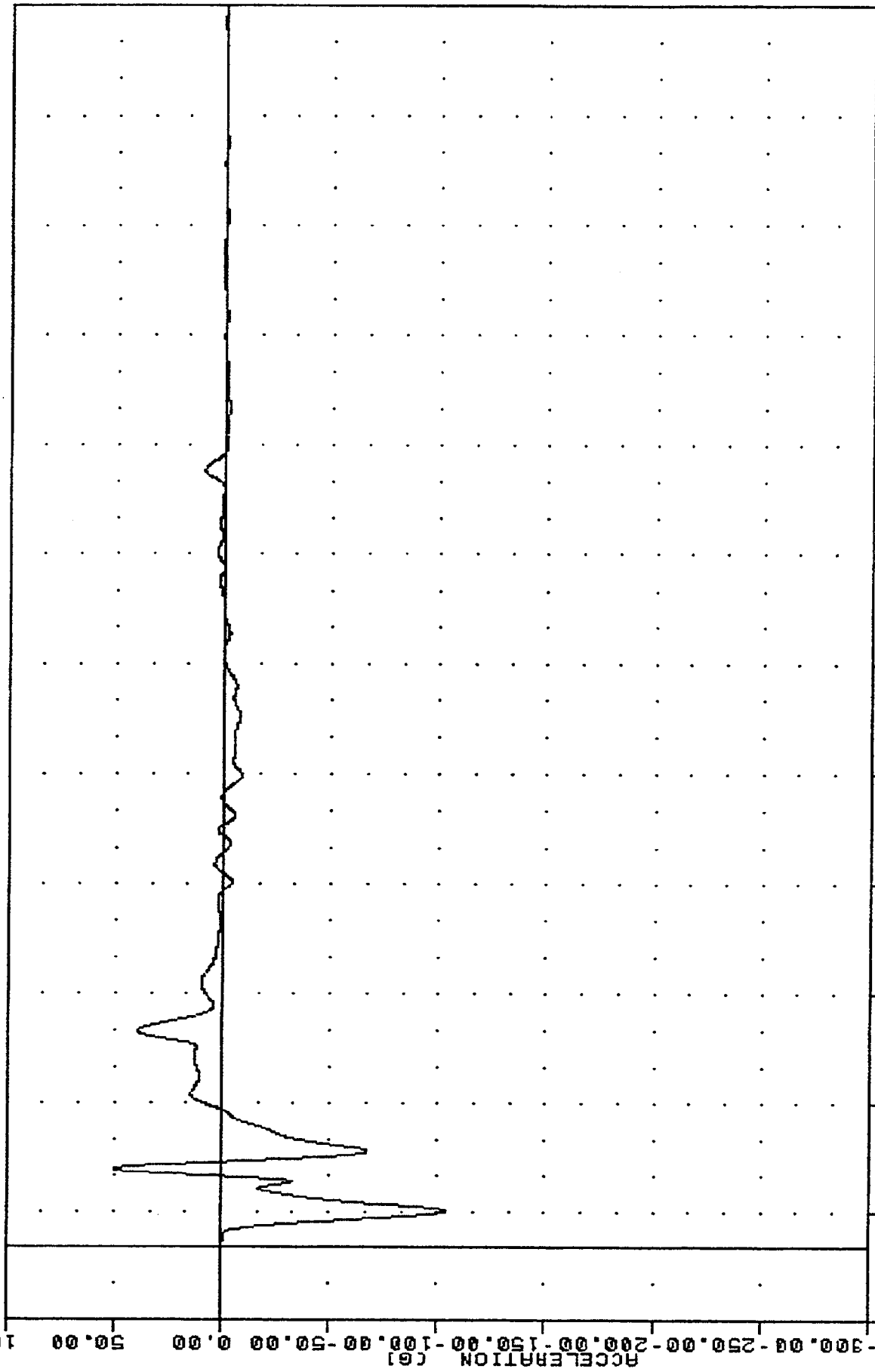


NYMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 RIGHT FRONT DOOR (POSITION 1) VELOCITY Y AXIS

TRC
850529
MVMA SIDE IMPACT TESTING
85149000000
RFDY62

PLUT DATE 11-JUN-85 15:23:10

FILTER = BLPF 100/ 316/ -40
MIN, MAX VALUES = -103.67 e 10.13, 50.18 e 21.63

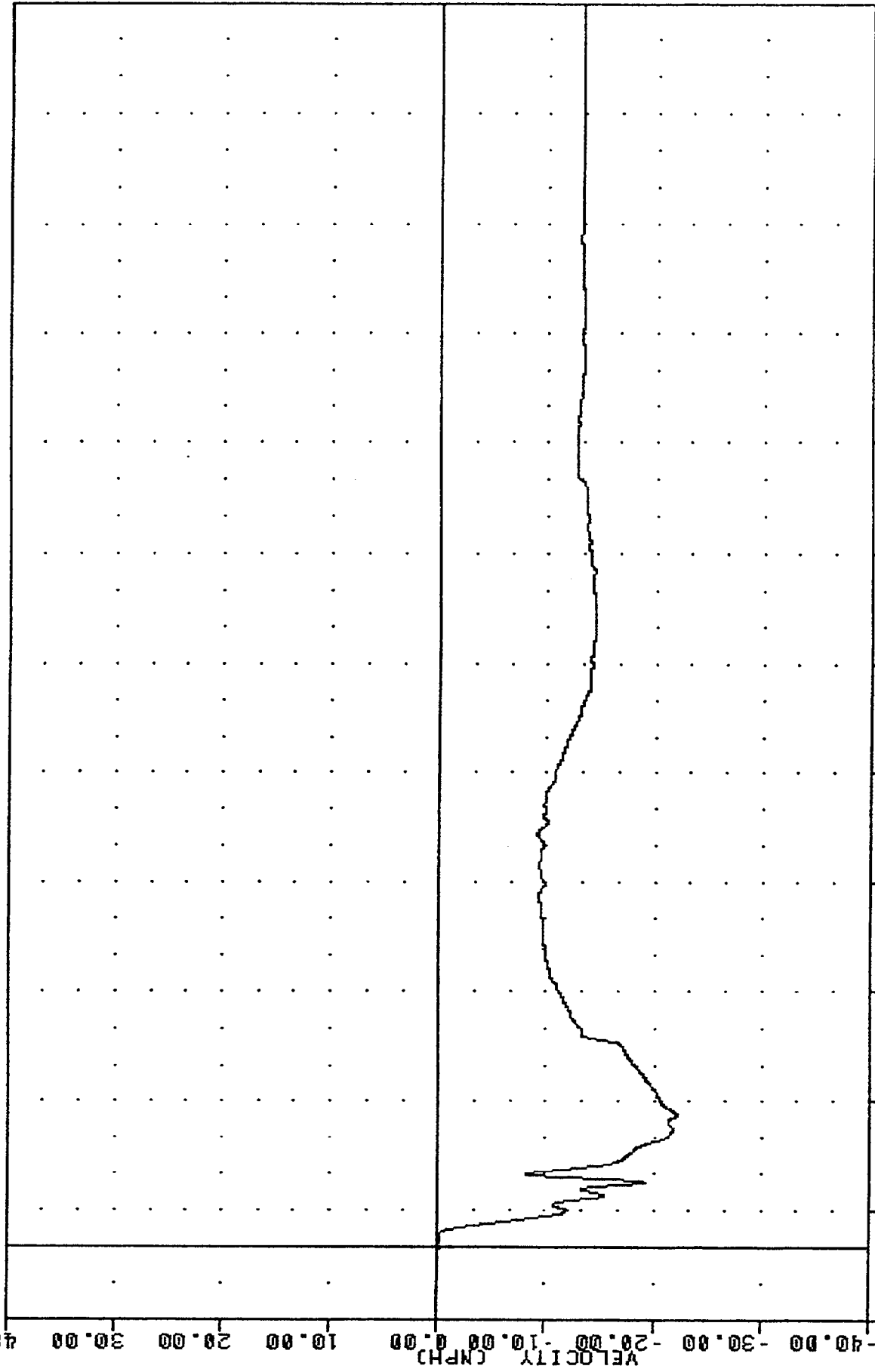


TIME (msec) 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
VEHICLE RIGHT FRONT DOOR (POSITION 2) ACCELERATION Y AXIS

TRC
 850529
 MYNA SIDE IMPACT TESTING
 8514900000
 RFDYY2

PLUT DATE 11-JUN-85 15:39:08

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -22.14e 36.50, 0.01 e -16.63

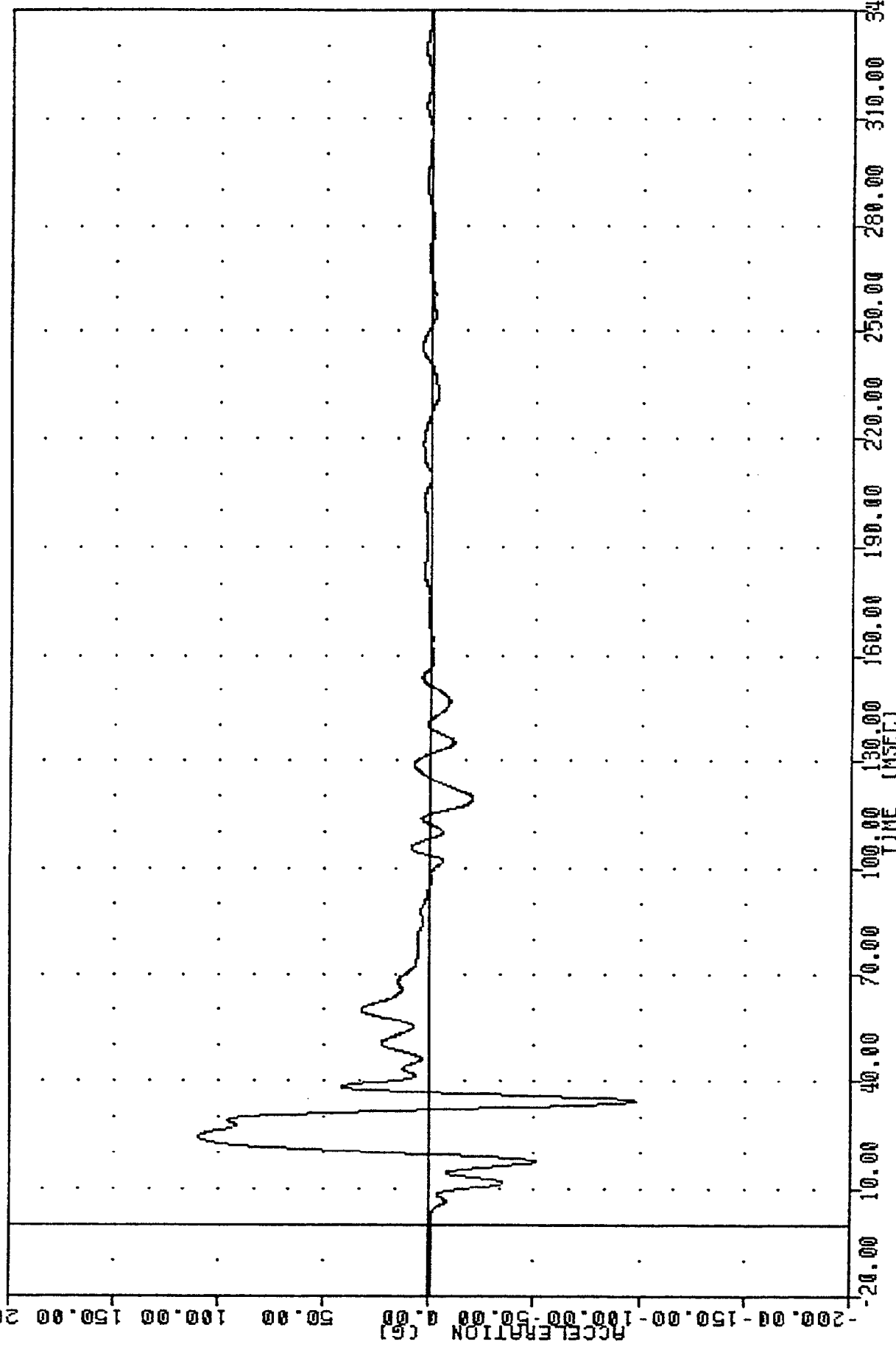


TIME (MSEC) 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 MYNA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 RIGHT FRONT DOOR (POSITION 2) VELOCITY Y AXIS

TPL 850529
MVMA SIDE IMPACT TESTING
8514900000
RFDY63

PLUT DATE 11-JUN-85 15:23:10

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -97.91 34.50, 109.97 24.63

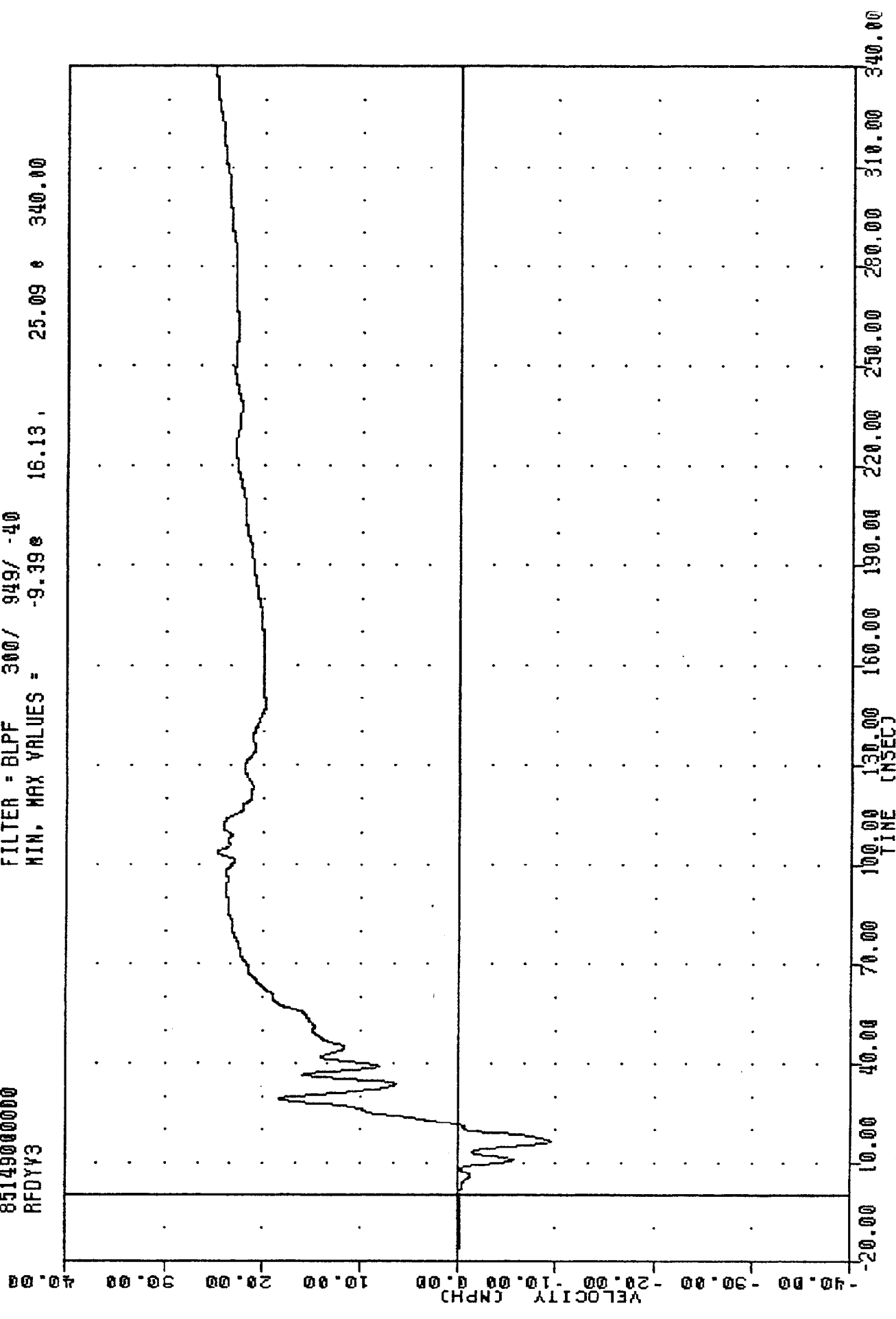


MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
VEHICLE RIGHT FRONT DOOR (POSITION 3) ACCELERATION Y AXIS

THC
850529
MVMA SIDE IMPACT TESTING
85149000000
RFDYV3

PLOT DATE 11-JUN-85 15:39:08

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -9.39e 16.13 25.09 e 340.00

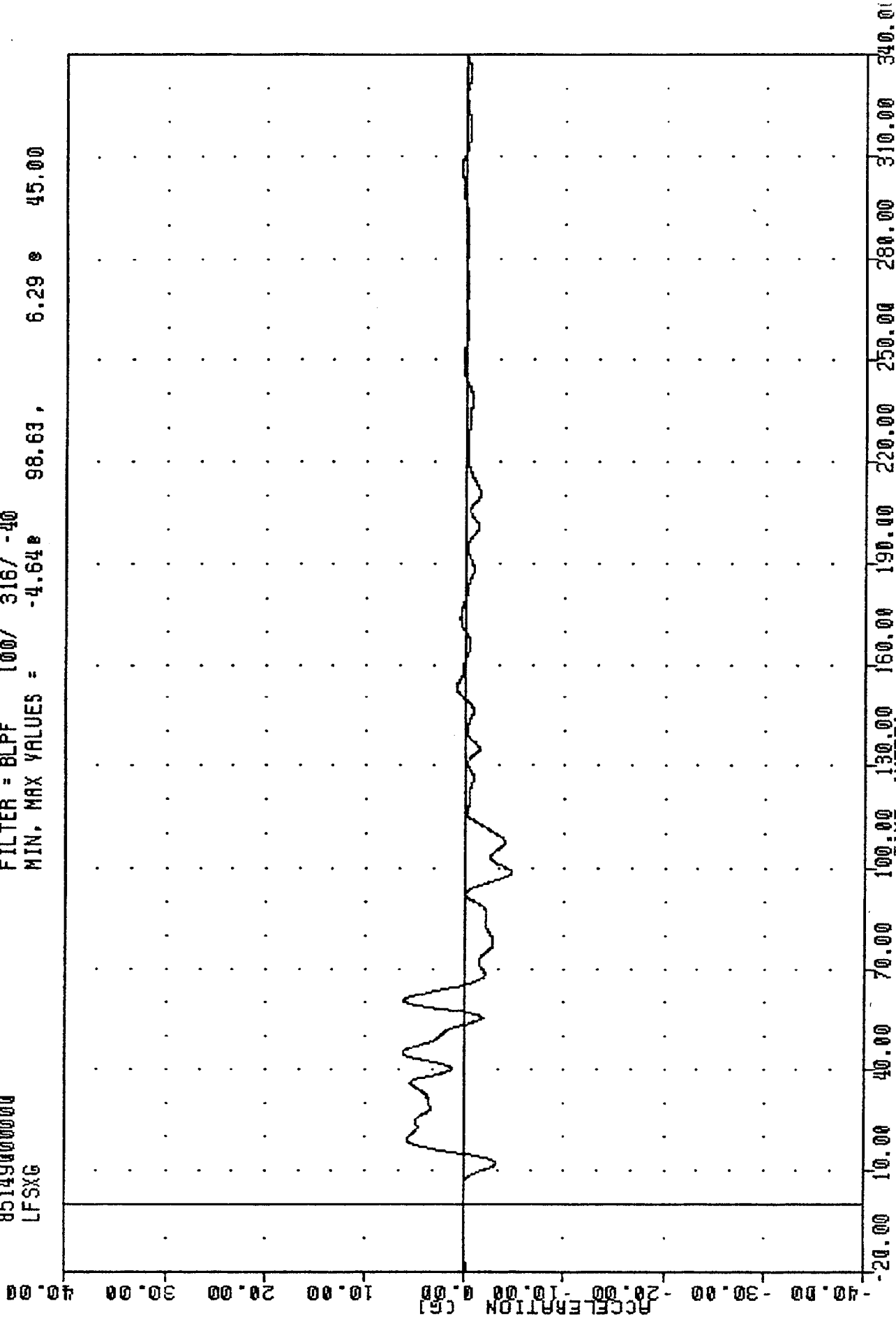


MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
RIGHT FRONT DOOR (POSITION 3) VELOCITY Y AXIS

TAC
 , 850529
 NVMA SIDE IMPACT TESTING
 85149000000
 LFSXG

PLOT DATE 11-JUN-85 15:23:10

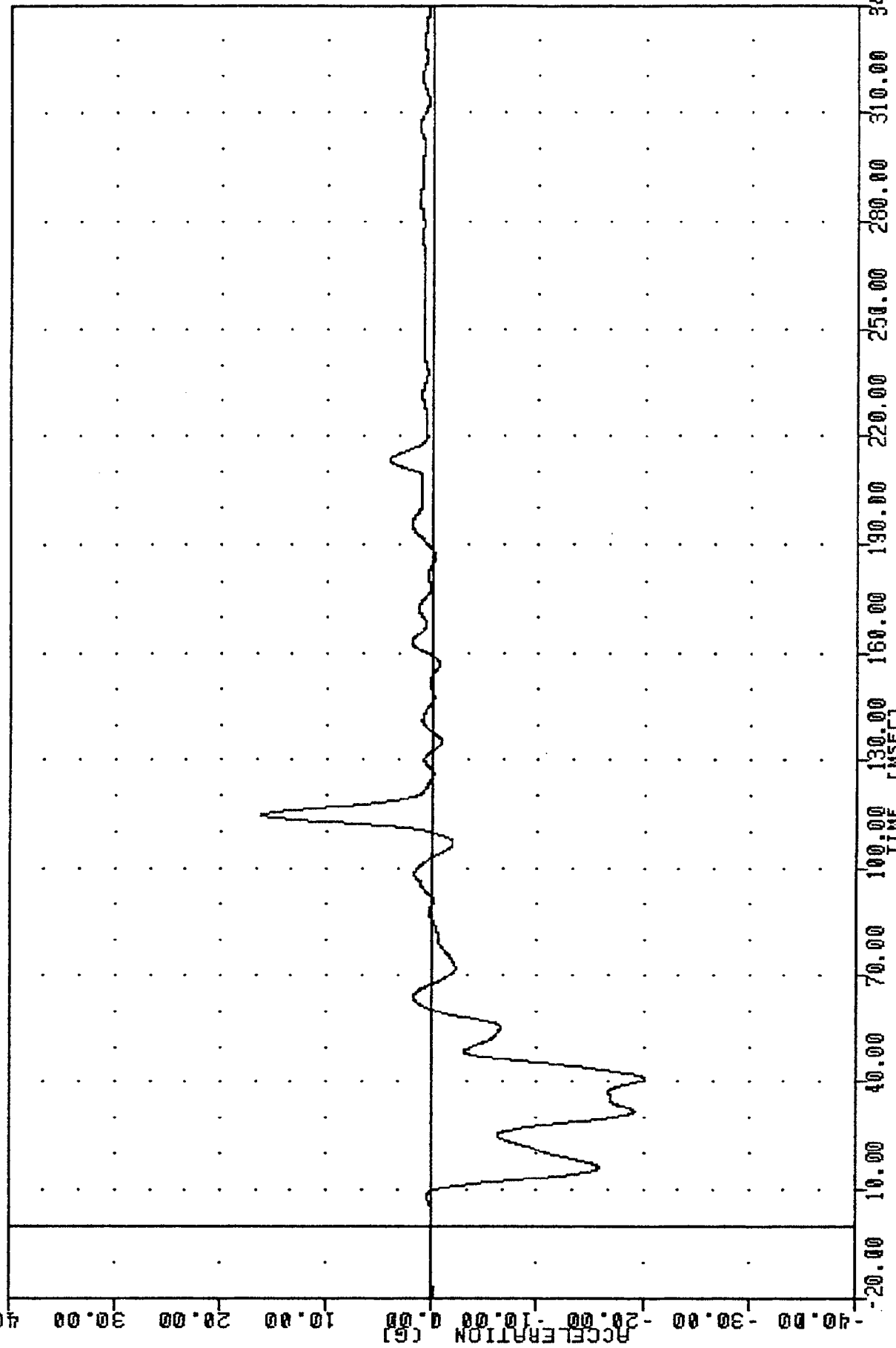
FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -4.64e 98.63, 6.29 e 45.00



NVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 VEHICLE LEFT FRONT SILL ACCELERATION X AXIS

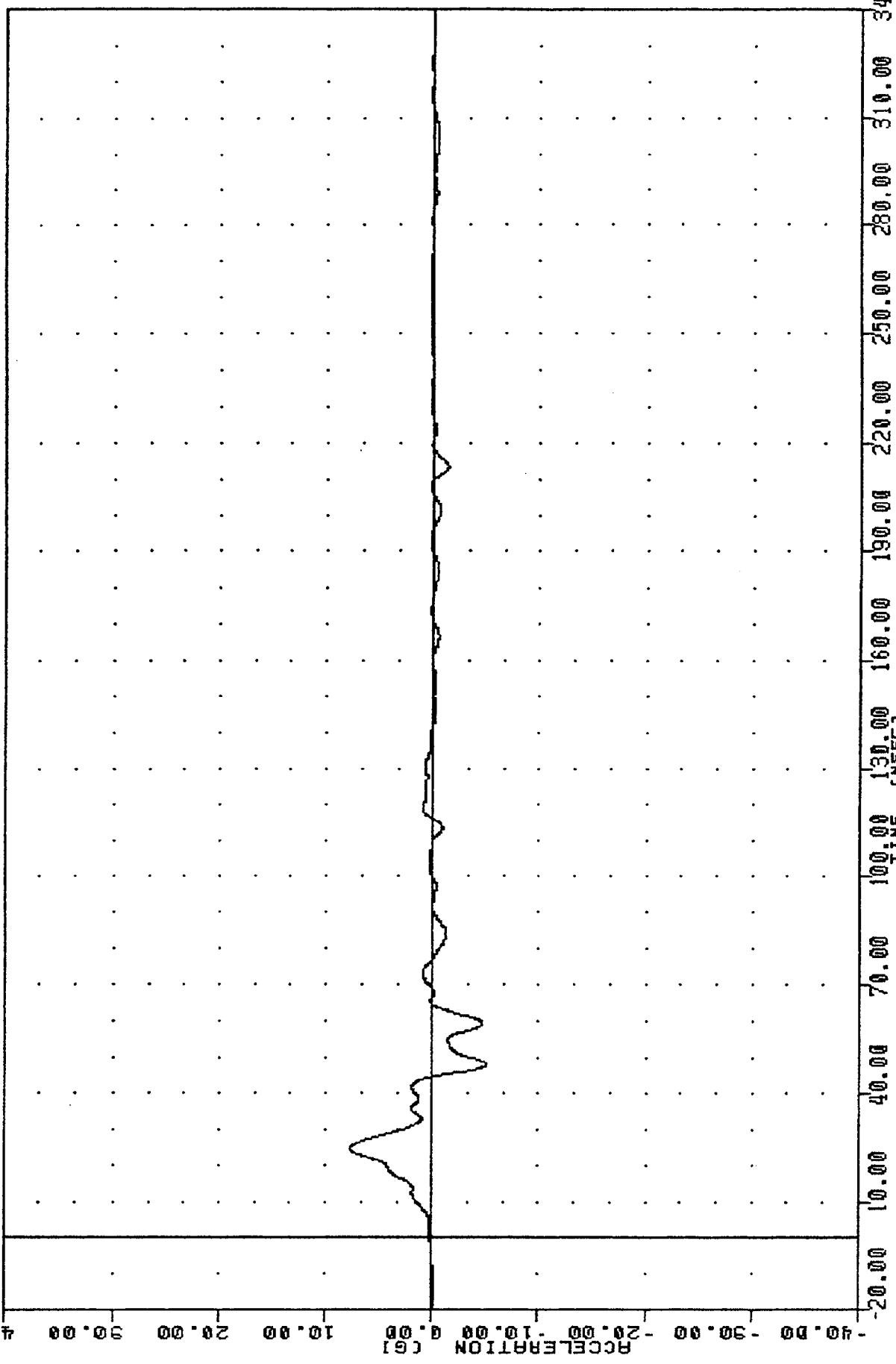
TRC 850529 11-JUN-85 15:23:10
 MVNA SIDE IMPACT TESTING
 8514900000
 LFSYG

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -20.15e 41.00. 16.13 e 114.63



MVNA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 VEHICLE LEFT FRONT SILL ACCELERATION Y AXIS

TRC
 MYMA SIDE IMPACT TESTING
 85149000000
 LFSZ6
 .850529
 PLOT DATE 11-JUN-85 15:23:10
 FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -5.12e 48.00 . 7.75 e 24.63



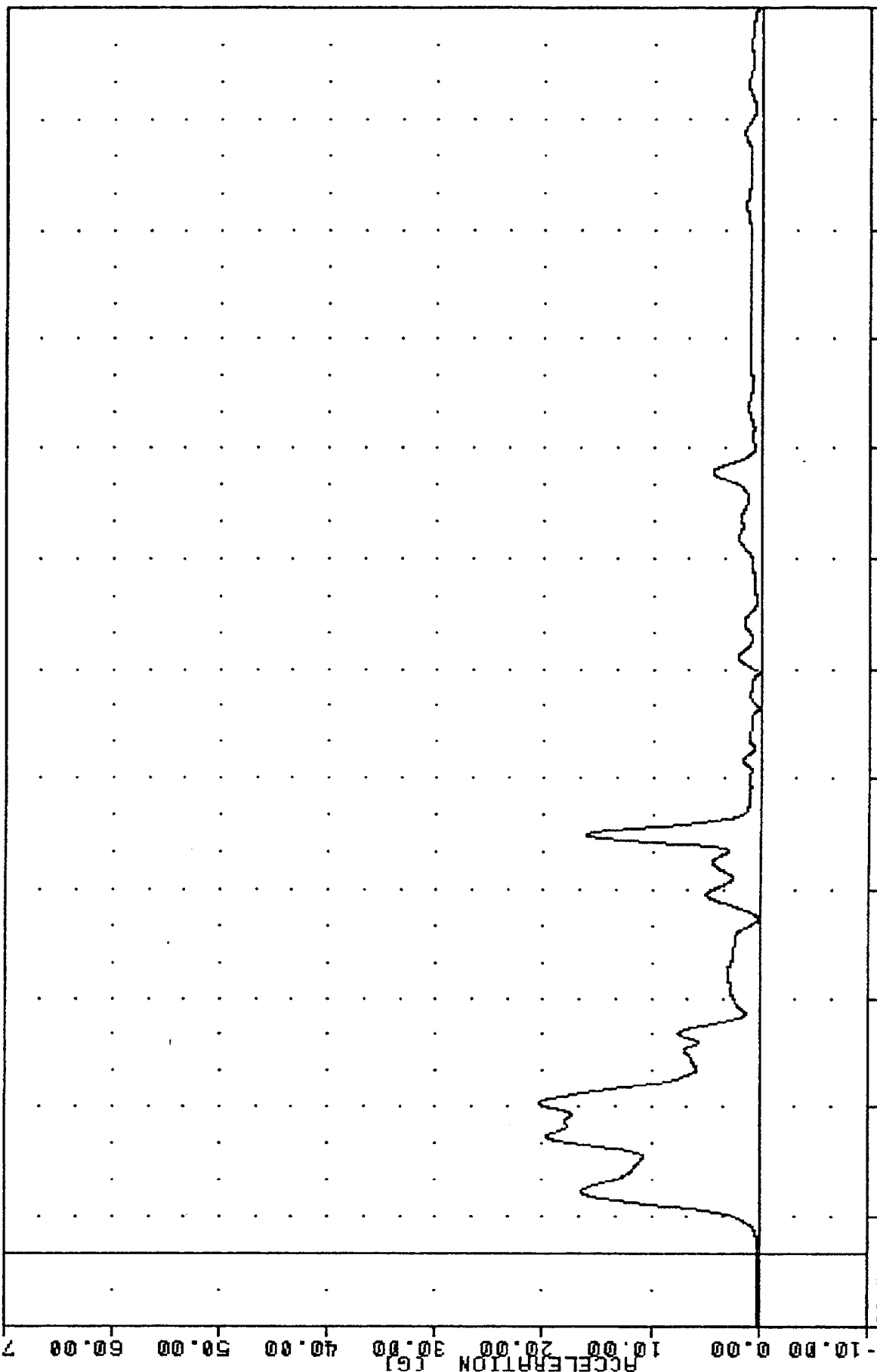
MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 VEHICLE LEFT FRONT SILL ACCELERATION Z AXIS

TRC
 NYMA SIDE IMPACT TESTING
 85149000000
 LFSRG

PLOT DATE 11-JUN-85 15:23:10

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = 0.03g 91.75, 20.30 e 41.00

ACCELERATION (g)



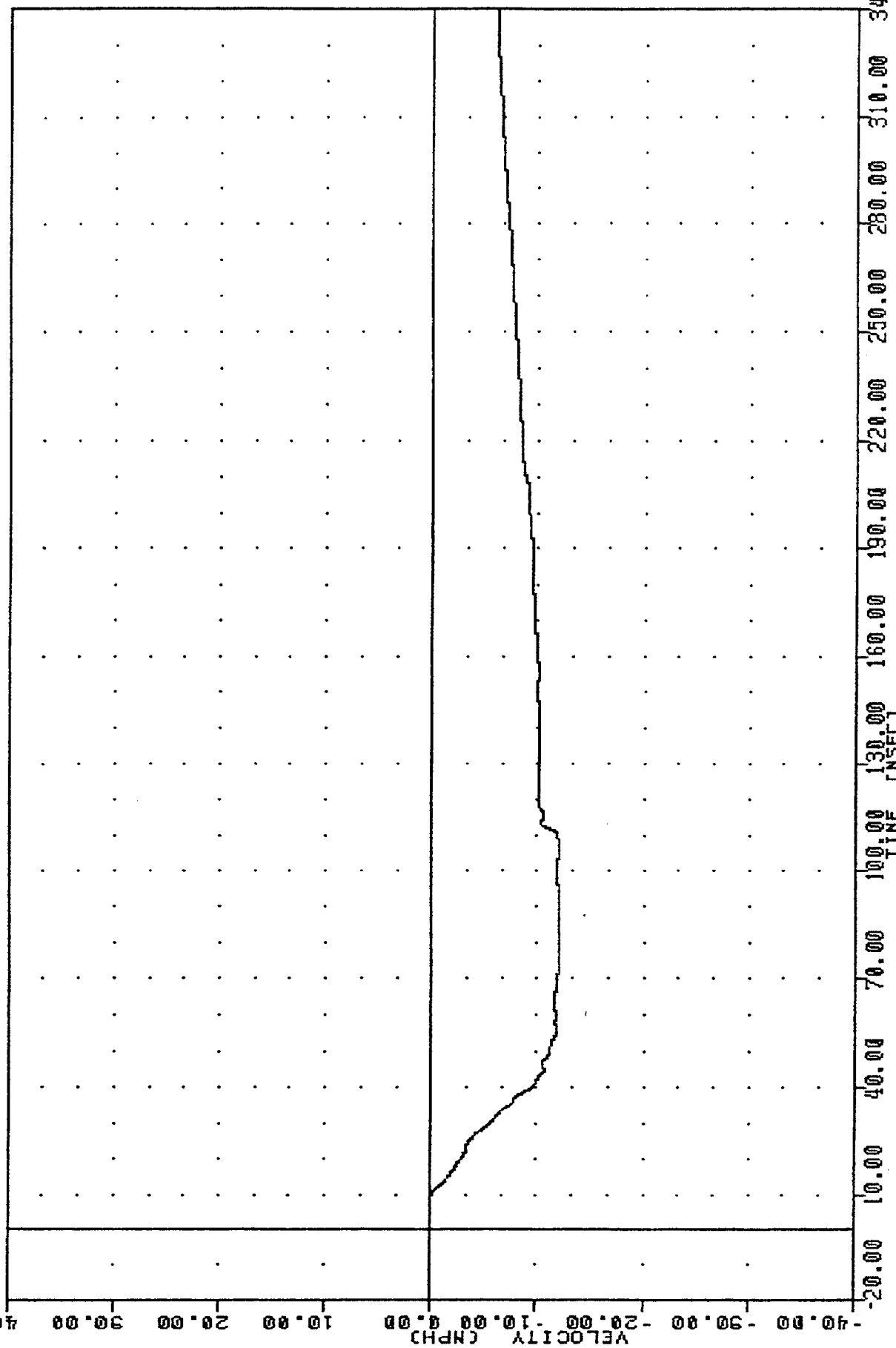
-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)

NYMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 VEHICLE LEFT FRONT SILL RESULTANT

TAC 850529
 MYMA SIDE IMPACT TESTING
 8514900000
 LFSYY

PLOT DATE 11-JUN-85 15:39:08

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -12.12e 80.75, 0.07 e 7.88

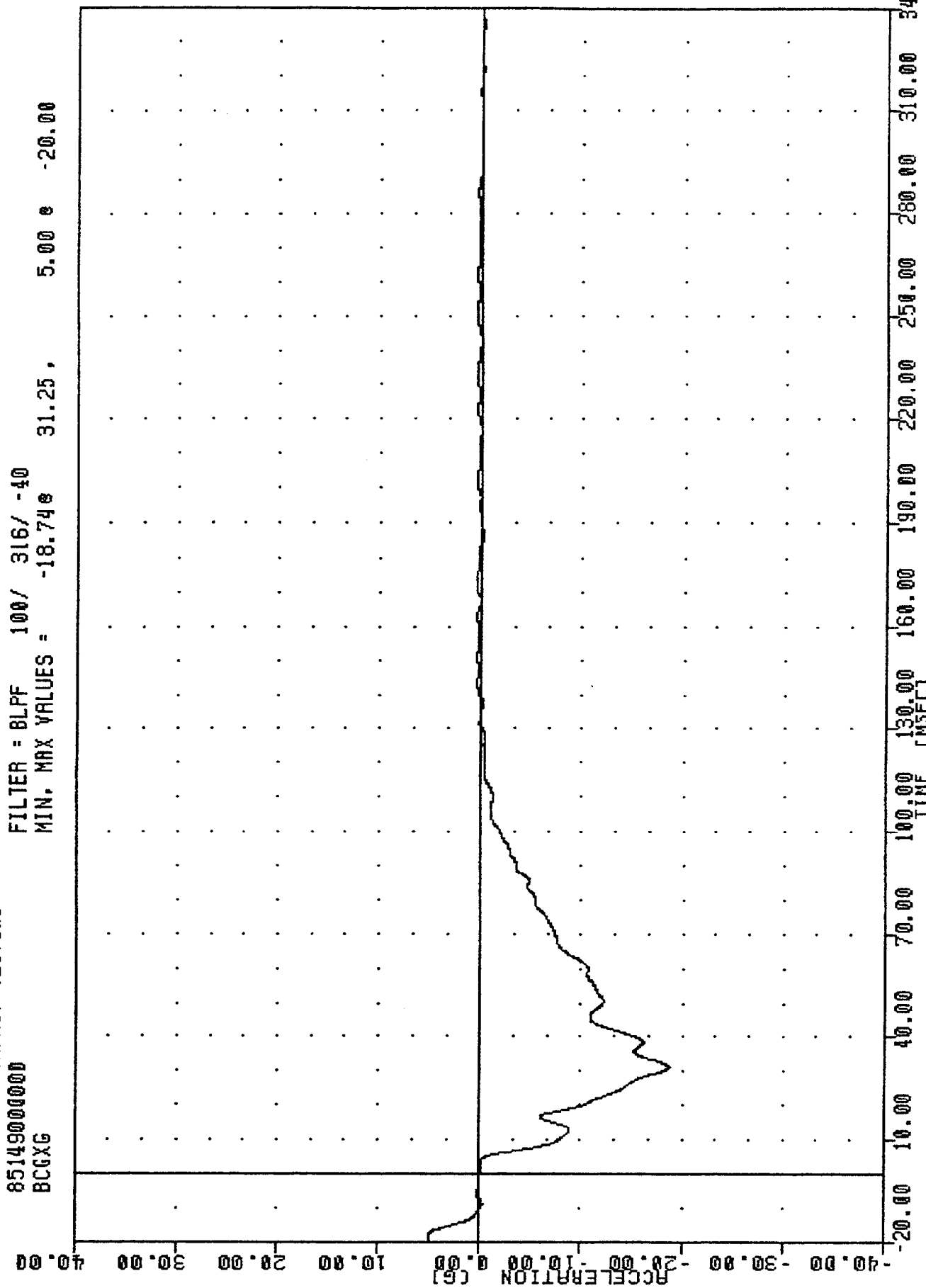


MYMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 LEFT FRONT SILL VELOCITY Y AXIS

TRC
 85149000000
 BCGXG
 MVNA SIDE IMPACT TESTING
 85149000000

PLOT DATE 11-JUN-85 15:23:10

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -18.74e 31.25, 5.00 e -20.00

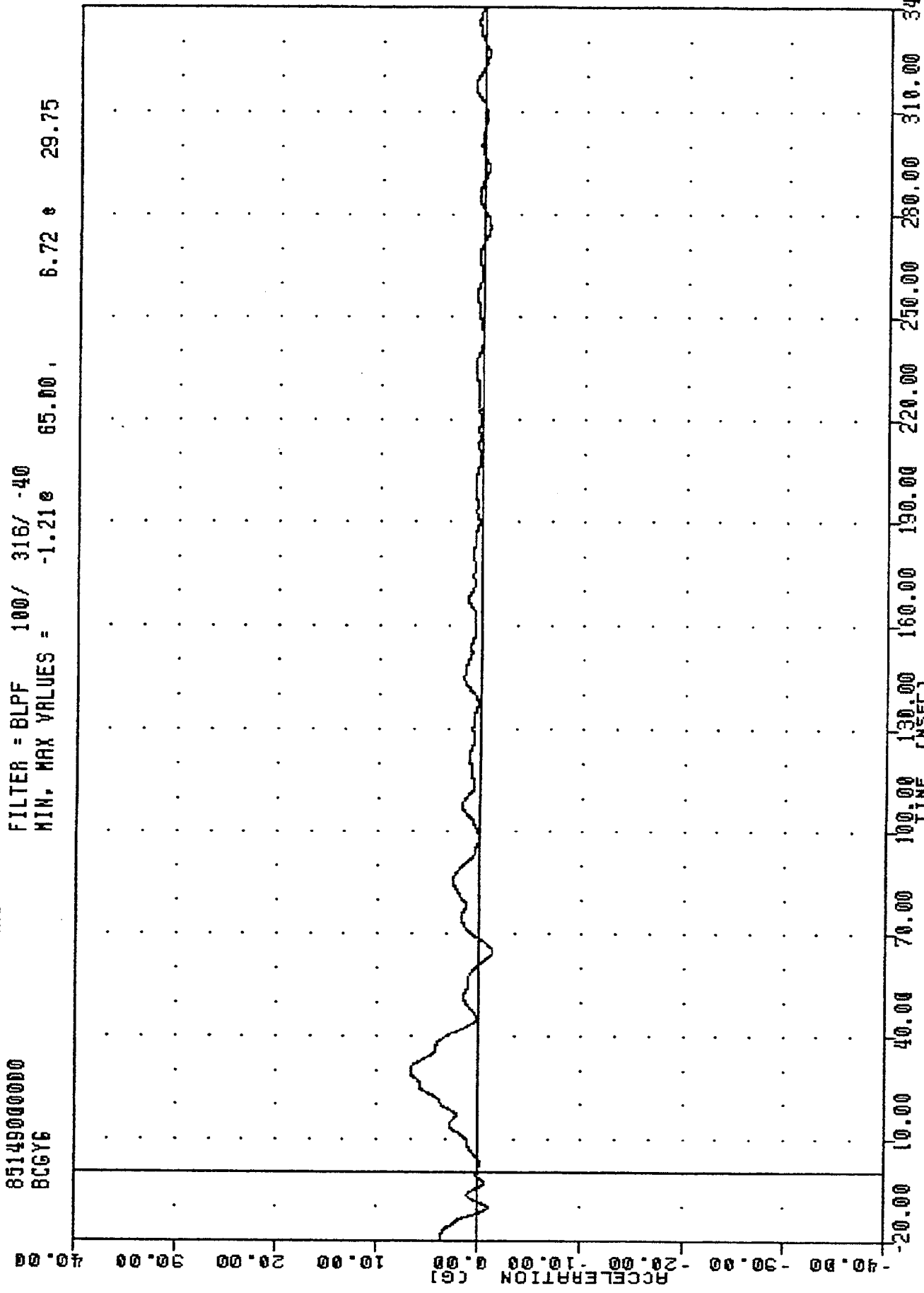


MVNA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 BARRIER CENTER OF GRAVITY X AXIS

MVMA SIDE IMPACT TESTING
 85149000000
 BCGY6

PLOT DATE 11-JUN-85 15:23:10

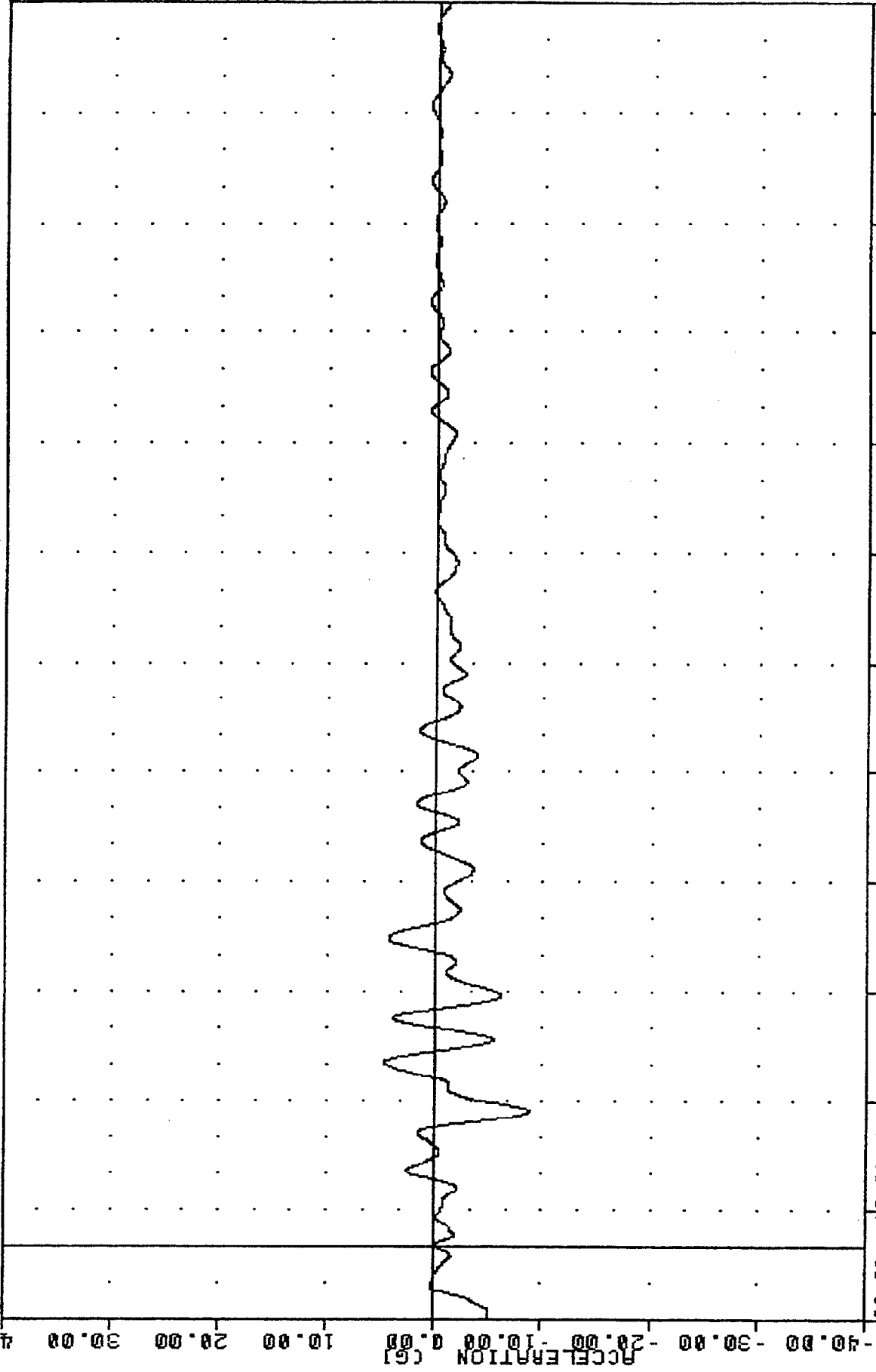
FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -1.21e 65.00 6.72 e 29.75



MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 BARRIER CENTER OF GRAVITY Y AXIS

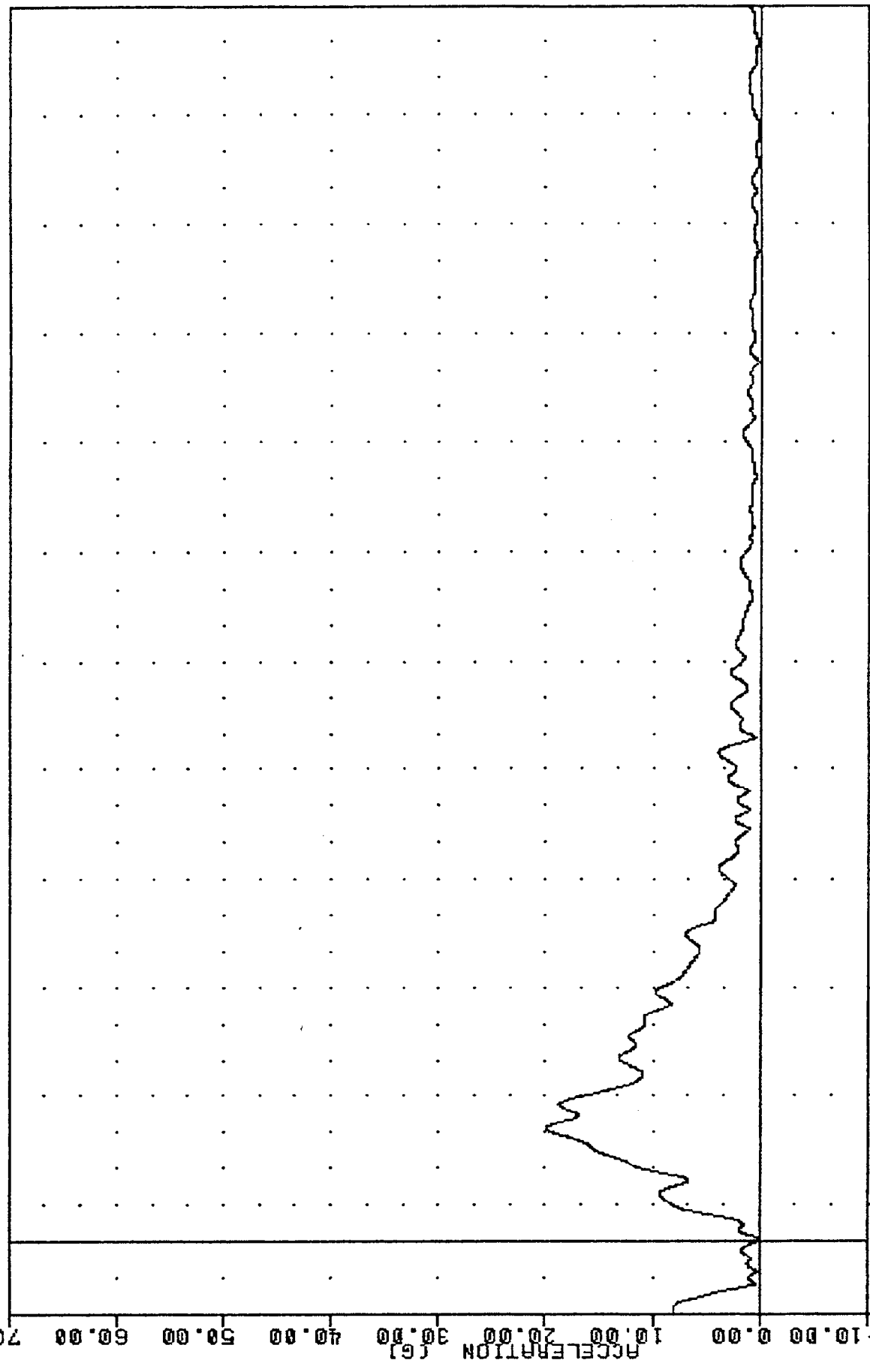
TMC 850529
 MVMA SIDE IMPACT TESTING
 8514900000
 BC626

PLOT DATE 11-JUN-85 15:23:10
 FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -8.86e 37.13, 4.70 e 50.63



MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 BARRIER CENTER OF GRAVITY Z AXIS

TRC 830529
 MYMA SIDE IMPACT TESTING
 8514900000
 BCGRG
 FILTER = 8LPF 100/ 316/ -40
 MIN. MAX VALUES = 0.03e 306.00, 19.90 e 31.13
 PLOT DATE 11-JUN-85 15:23:10



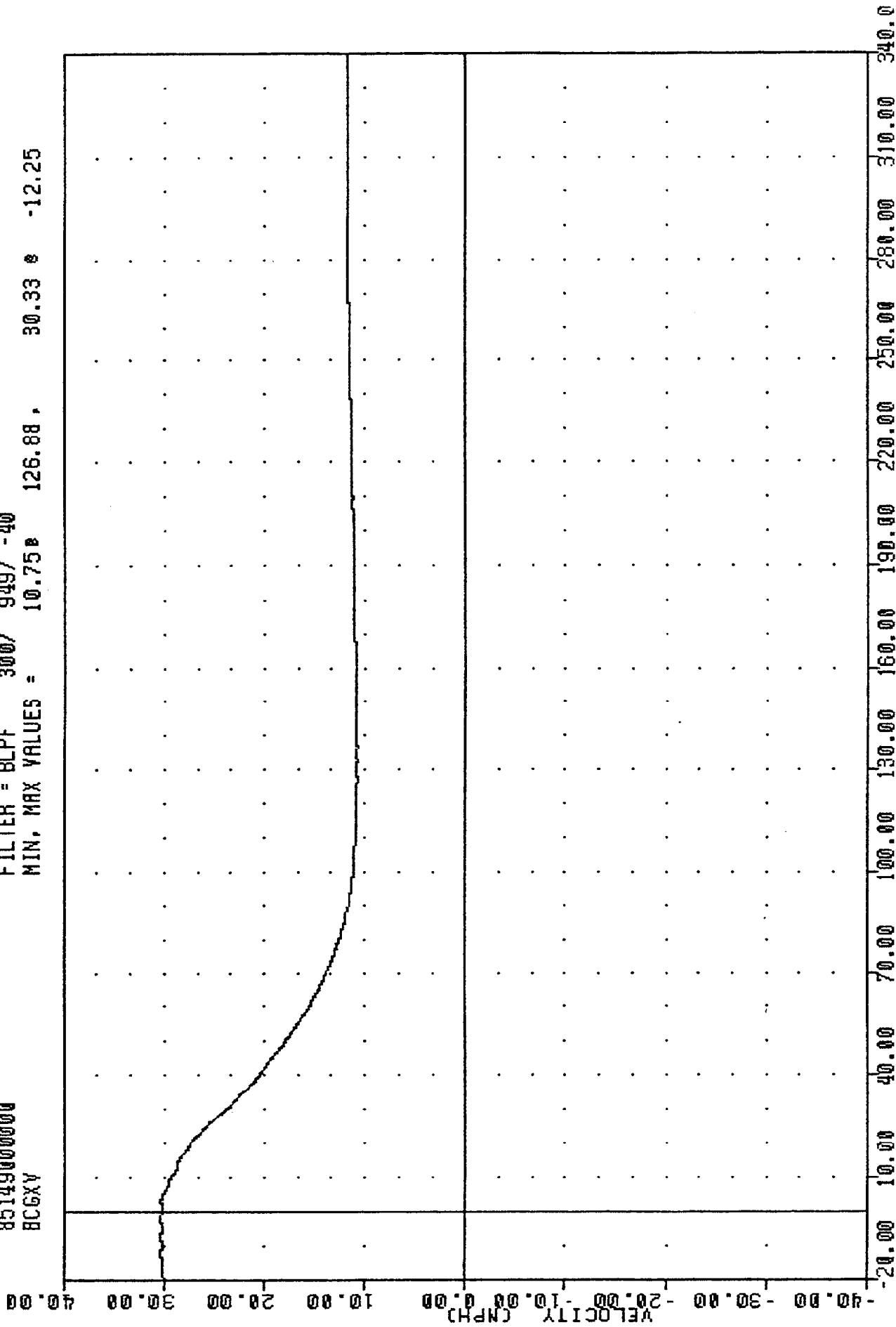
-10.00 0.00 10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00 210.00 220.00 230.00 240.00 250.00 260.00 270.00 280.00 290.00 300.00 310.00 320.00 330.00 340.00
 TIME (MSEC)

MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 BARRIER CENTER OF GRAVITY RESULTANT ACCELERATION

TRC
 85149000000
 BC6XY
 NYMA SIDE IMPACT TESTING

PLOT DATE 11-JUN-85 15:39:08

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = 10.758 126.88, 30.33 8 -12.25



NYMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 BARRIER CENTER OF GRAVITY VELOCITY X AXIS

TRC
 85149000000
 MYMA SIDE IMPACT TESTING
 850529

PLOT DATE 11-JUN-85 15:39:08

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = 14.60e -20.00, 21.89 e 340.00

40.00

30.00

20.00

10.00

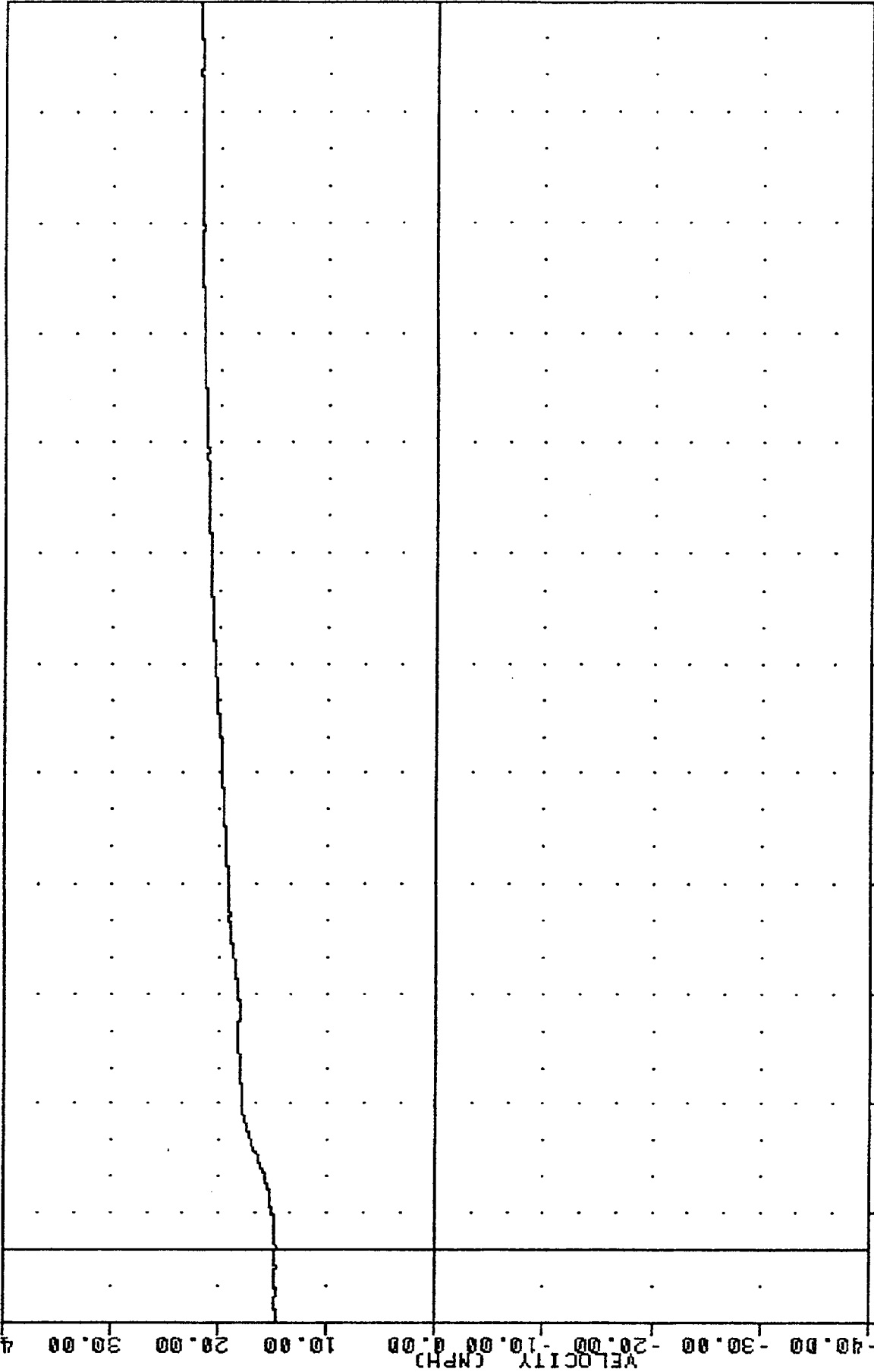
0.00

-10.00

-20.00

-30.00

-40.00



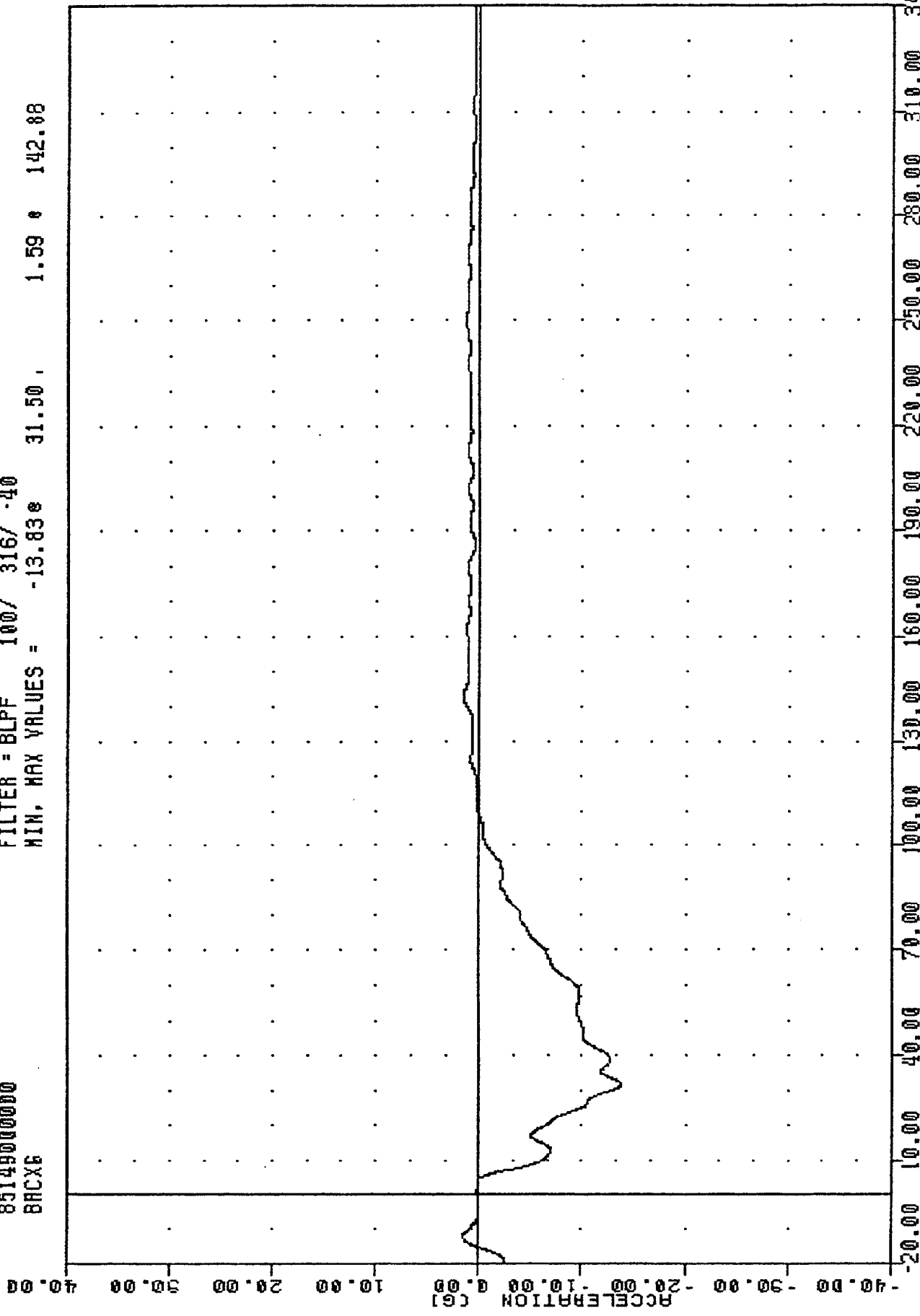
100.00 130.00 150.00 190.00 220.00 250.00 280.00 310.00 340.00
 TIME (MSEC)

MYMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 BARRIER CENTER OF GRAVITY VELOCITY Y AXIS

TAC
 850529
 MVMA SIDE IMPACT TESTING
 85149000000
 BACX6

PLOT DATE 11-JUN-85 15:23:10

FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = -13.83e 31.50, 1.59 e 142.88

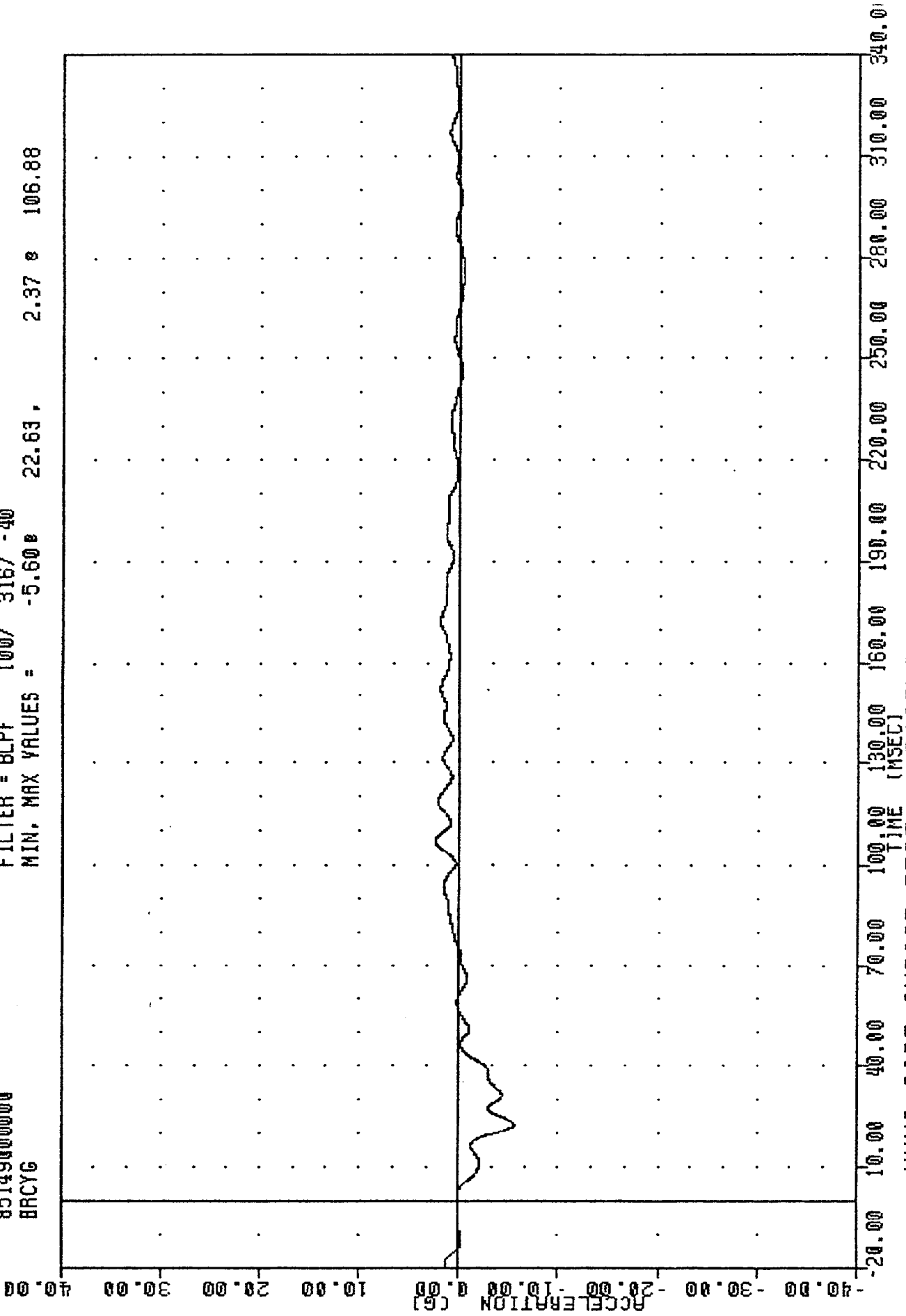


MVMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 BARRIER REAR CROSSMEMBER ACCELERATION X AXIS

TRC
 85149000000
 NVMA SIDE IMPACT TESTING
 BRCYG

PLOT DATE 11-JUN-85 15:23:10

FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -5.608 22.63 , 2.37 106.88

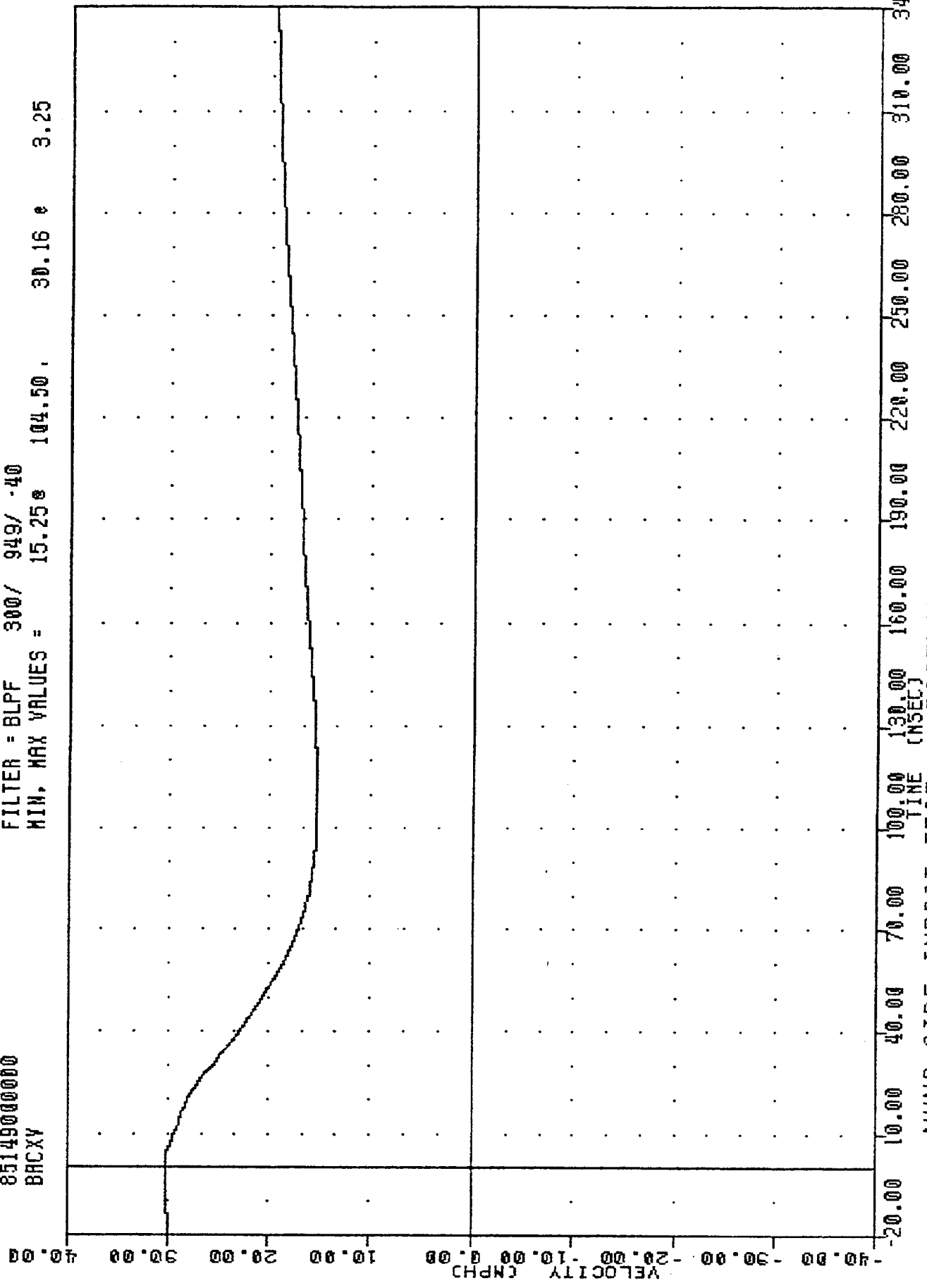


MYMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 BARRIER REAR CROSSMEMBER ACCELERATION Y AXIS

850528
 MYMA SIDE IMPACT TESTING
 85149000000
 BRXY

PLOT DATE 11-JUN-85 15:39:08

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = 15.25e 104.50, 30.16 e 3.25

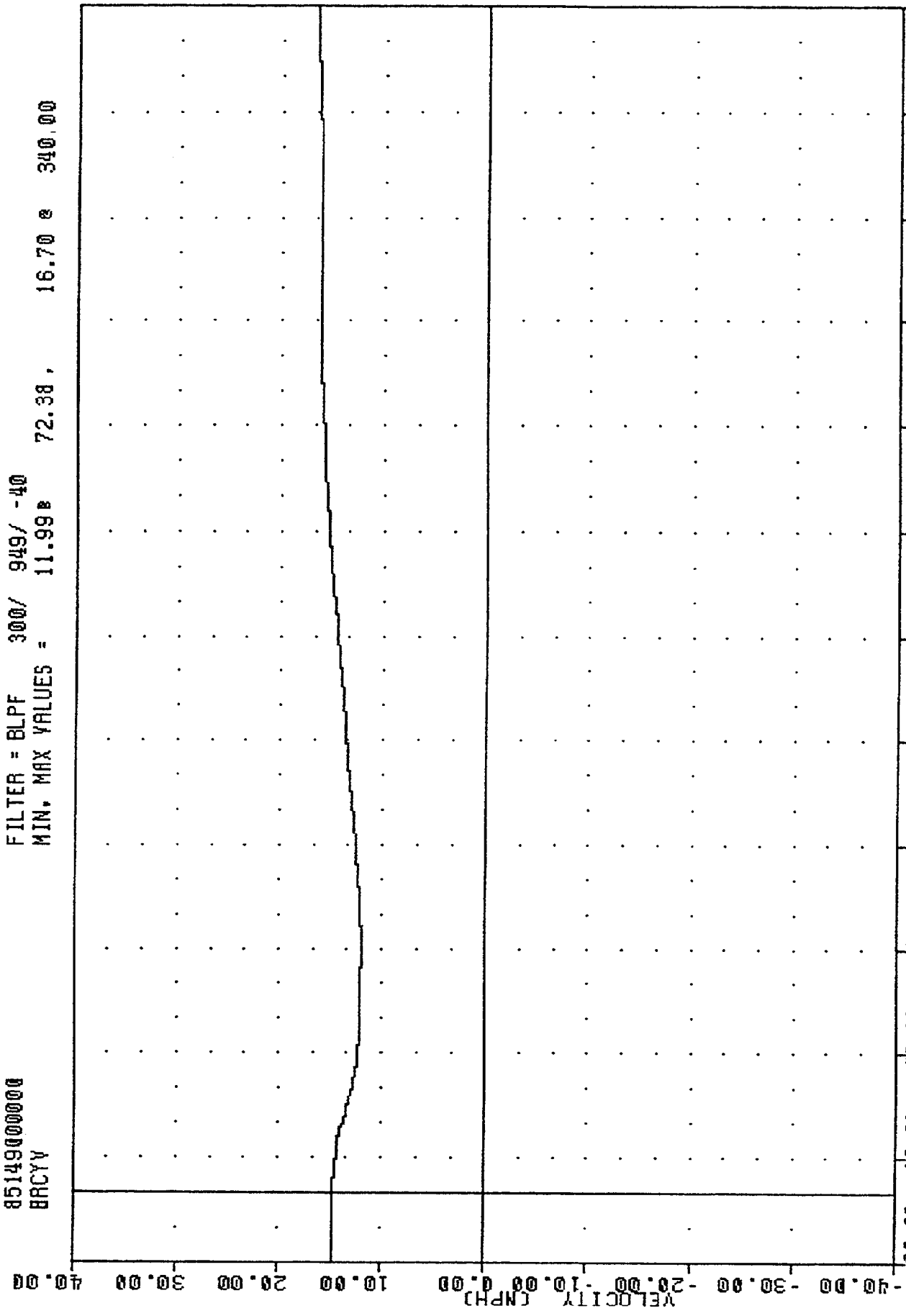


MYMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 BARRIER REAR CROSSMEMBER VELOCITY X AXIS

TRC 850529
 NYMA SIDE IMPACT TESTING
 85149000000
 BRCTV

PLOT DATE 11-JUN-85 15:39:08

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = 11.99 72.38 , 16.70 340.00



NYMA SIDE IMPACT TEST -- BASELINE STRUCTURE/HARDBOARD/NEAR SEATING
 BARRIER REAR CROSSMEMBER VELOCITY Y AXIS

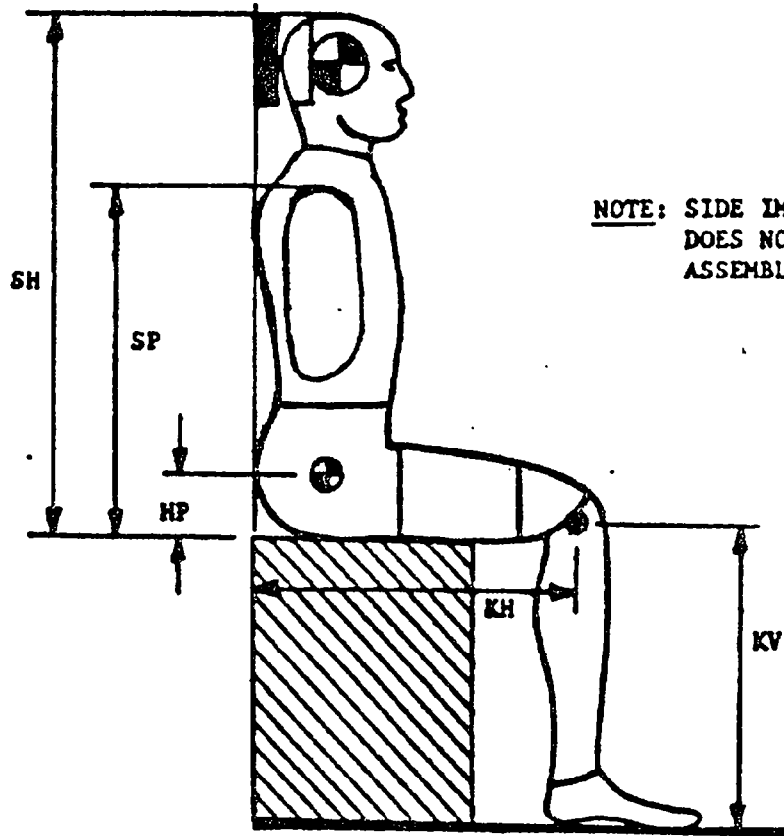
APPENDIX C
DUMMY CERTIFICATION

PART 572 DUMMY CALIBRATIONS

SIDE IMPACT DUMMY CONFIGURATION VERIFICATION TEST DATA

NHTSA DUMMY I.D. NO.:

1	1	9
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NOTE: SIDE IMPACT DUMMY (SID) DOES NOT HAVE ANY ARM ASSEMBLIES

	P. 572 SPECIFICATION	PRE-TEST	POST-TEST
DATE OF CONFIGURATION VERIFICATION		5/9/85	DNA
VERIFICATION NUMBER FOR DUMMY*		119 - 01	DNA
SH - Seated Height- - - - -	35.6 to 35.8"	35.4	DNA
SP - Shoulder Height- - - -		DNA	DNA
HP - Hip Pivot Height - - - -	3.9" ref.	3.9	DNA
KH - Knee Pivot from back line- -	20.1 to 20.7"	20.4	DNA
KV - Knee Pivot from floor- - -	19.3 to 19.9"	19.4	DNA
SW - Shoulder Width - - - - -		18.7	DNA
HW - Hip Width- - - - -	14.0 to 15.4"	14.6	DNA

TECHNICIAN'S NAME: Larry Phelps

* Sequential number beginning with "1" at the start of each fiscal year's crash test program

TRANSPORTATION RESEARCH CENTER OF OHIO

ABDOMINAL COMPRESSION TEST

PART 572

09-MAY-85

TEMPERATURE 69.00 F
MVMA AB11901

RELATIVE HUMIDITY 59.00 %
572 SN 119 ABDOM COMP CAL 01

TEST CORRIDORS		
DISPLACEMENT	FORCE	TEST RESULTS
0 IN.	10 LBS	10 LBS
.50 IN.	23.00 - 36.00 LBS	26.05 LBS
.75 IN.	36.00 - 50.00 LBS	38.31 LBS
1.00 IN.	50.00 - 63.00 LBS	53.78 LBS
1.30 IN.	73.00 - 88.00 LBS	77.57 LBS

DUMMY MEETS SPECIFICATIONS

TECHNICIAN *Mary S. Phelps*
TEST SUPERVISOR *V.L. Watters*

TRANSPORTATION RESEARCH CENTER OF OHIO

LUMBAR FLEXION TEST

PART 572

09-MAY-85

TEMPERATURE 69.00 F
MVMA LF11901

RELATIVE HUMIDITY 59.00 %
572/SID 119 LUMBAR FLEX CAL 01

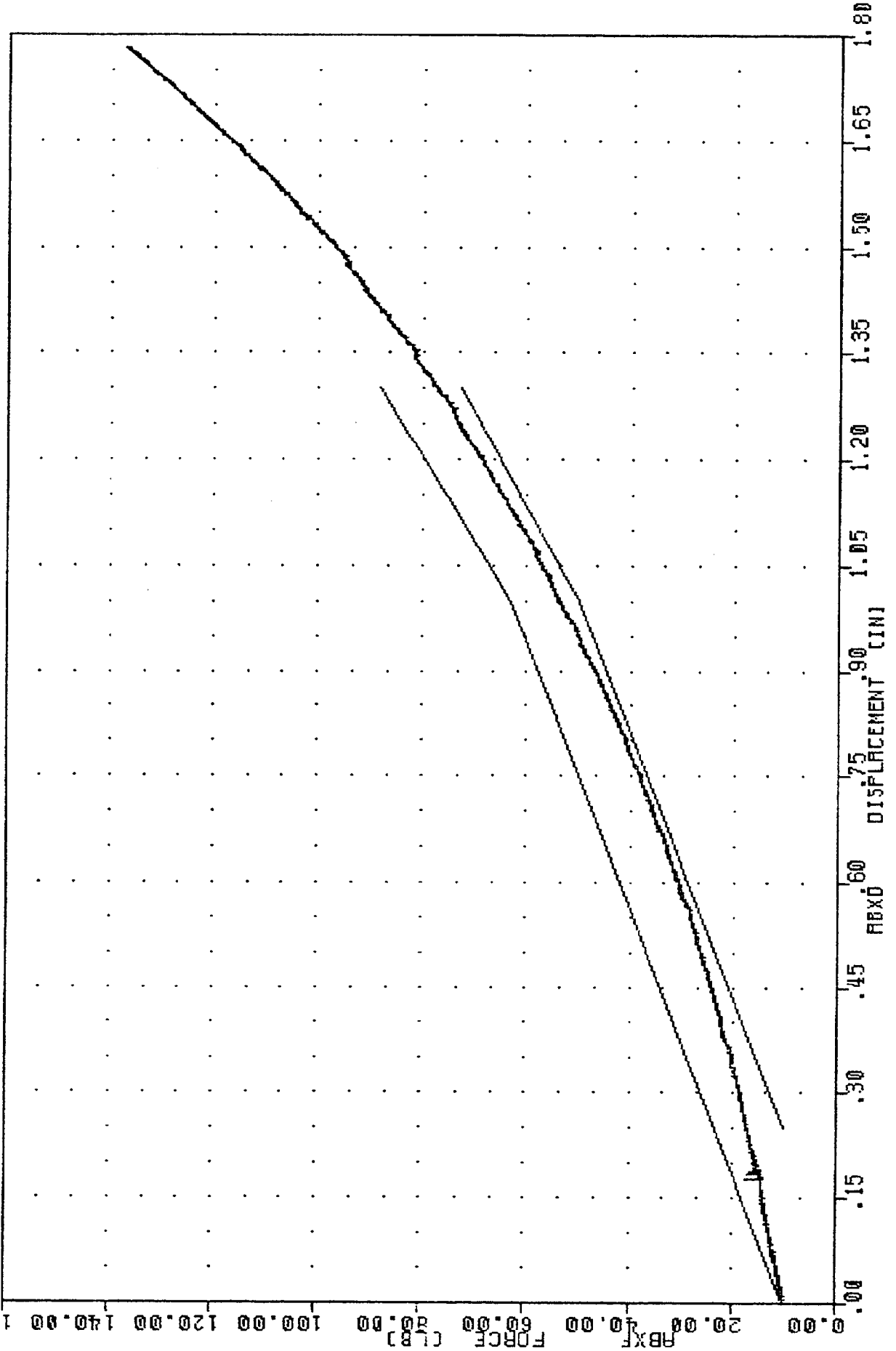
DEFLECTION	SPECIFICATION	TEST RESULTS
0 Deg.	0 LBS	0.00 LBS
20 Deg	22.00 - 34.00 LBS	32.00 LBS
30 Deg	34.00 - 46.00 LBS	44.00 LBS
40 Deg	46.00 - 58.00 LBS	50.00 LBS
NET RETURN ANGLE	< 12 DEG	9.58 DEG

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Gay L. Phelps

TEST SUPERVISOR K.J. Wetters

MYHA ABX1901
 ABXD 572 SM 119 ABDOM COMP CAL 01
 ABXF 1650/ 5214/ -40 MIN, MAX =
 FILTER = ALPF 1650/ 5214/ -40 MIN, MAX =
 85129 0.000 9.855
 PLOT DATE 9-MAY-85 14:59:02
 0.00 0.01 136.97
 1.78 1.78 1.78



ABDOMINAL COMPRESSION VS DISPLACEMENT

TRANSPORTATION RESEARCH CENTER OF OHIO

HEAD DROP TEST

PART 572

24-MAY-85

TEMPERATURE 69 F
MVMA HD11901

RELATIVE HUMIDITY 64 %
572 SN 119 HEAD DROP CAL 01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PEAK RESULTANT ACCELERATION	210 - 260 G	236.82 G
TIME ABOVE 100 G LEVEL	0.9 - 1.5 MS	1.16 MS
PEAK LATERAL ACCELERATION	10 G MAX	2.83 G
IS ACCELERATION CURVE UNIMODAL?		YES

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Gary L. Phelps

TEST SUPERVISOR V.A. Wetters

TRANSPORTATION RESEARCH CENTER OF OHIO

NECK PENDULUM TEST

PART 572

10-MAY-85

TEMPERATURE 69.00 F
MVMA HN11901

RELATIVE HUMIDITY 65.00 %
572 SN 119 HEAD/NECK CAL 01

Test Parameter	Specification	Test Results
Pendulum velocity	21.5 to 25.5 fps	22.86 fps
Pendulum Deceleration:		
T1 - T2: 5 - 20 G	3 ms. max	1.98 ms.
T2 - T3: 20 - 20 G	25 - 30 ms.	28.41 ms.
T3 - T4: 20 - 5 G	10 ms. max	3.83 ms.
Avs. G level T2 - T3	20 - 24 G	23.19 G
Maximum Rotation Angle	63 - 73 deg.	63.70 deg.
Peak Head Resultant Accel	26 G max	24.11 G

Test Parameter	Specification	Test Results
Rotation Angle (degrees)	Time (ms.)	Chordal Disp. (in.)
0	-2.0 - +2.0	-0.5 - +0.5
30	25.6 - 34.4	2.1 - 3.1
60	40.3 - 51.7	4.3 - 5.3
max	53.2 - 66.8	5.0 - 6.0
60	67.0 - 83.0	4.3 - 5.3
30	85.4 - 104.6	2.1 - 3.1
0	101.0 - 123.0	-0.5 - +0.5

* DUMMY MEETS SPECIFICATIONS

TECHNICIAN Gary S. Phelps

TEST SUPERVISOR V.L. Watters

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

PART 572

13-MAY-85

TEMPERATURE 70 F
MVMA TL11901

RELATIVE HUMIDITY 66 %
572 SN 119 L.S.THORAX CAL 01

LOW SPEED TEST		
TEST PARAMETER	SPECIFICATION	TEST RESULTS
PENDULUM VELOCITY	13.86-14.14 FT/SEC	14.04 FT/SEC
PEAK DEFLECTION	1.1 INCHES MAX.	0.91 INCHES
PEAK RESISTIVE FORCE	1,450. POUNDS MAX.	1271. POUNDS
INTERNAL HYSTERESIS	50% - 70%	60.2%

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Larry L. Phelps

TEST SUPERVISOR

V.L. Watters

TRANSPORTATION RESEARCH CENTER OF OHIO

THORAX IMPACT TEST

PART 572

13-MAY-85

TEMPERATURE 69 F
MVMA TH11901

RELATIVE HUMIDITY 66 %
572 SN 119 H.S.THORAX CAL 01

TEST PARAMETER	HIGH SPEED TEST	
	SPECIFICATION	TEST RESULTS
PENDULUM VELOCITY	21.78-22.22 FT/SEC	22.22 FT/SEC
PEAK DEFLECTION	1.7 INCHES MAX.	1.49 INCHES
PEAK RESISTIVE FORCE	2,250. POUNDS MAX.	1973. POUNDS
INTERNAL HYSTERESIS	50% - 70%	58.5%

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Mary L. Phelps

TEST SUPERVISOR

V.L. Wetters

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

PART 572

13-MAY-85

TEMPERATURE 69 F
RIGHT KNEE
MUMA RK11901

RELATIVE HUMIDITY 64 %
572 SN 119 R.KNEE IMP CAL 01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	6.76 - 7.04 FT/SEC	6.90 FT/SEC
PEAK KNEE IMPACT FORCE	1850 - 2500 LBS.	2027.48 LBS.
DURATION ABOVE 1000 LBS.	≥ 1.7 MS.	1.83 MS.

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Larry S. Phelps
TEST SUPERVISOR V.L. Watters

TRANSPORTATION RESEARCH CENTER OF OHIO

KNEE IMPACT TEST

PART 572

13-MAY-85

TEMPERATURE 69 F
LEFT KNEE
MVMA LK11901

RELATIVE HUMIDITY 63 %
572 SN 119 L.KNEE IMP CAL 01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
PROBE VELOCITY	6.76 - 7.04 FT/SEC	6.90 FT/SEC
PEAK KNEE IMPACT FORCE	1850 - 2500 LBS.	2473.80 LBS.
DURATION ABOVE 1000 LBS.	≥ 1.7 MS.	1.72 MS.

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Mary L Phelps

TEST SUPERVISOR P.L. Watters

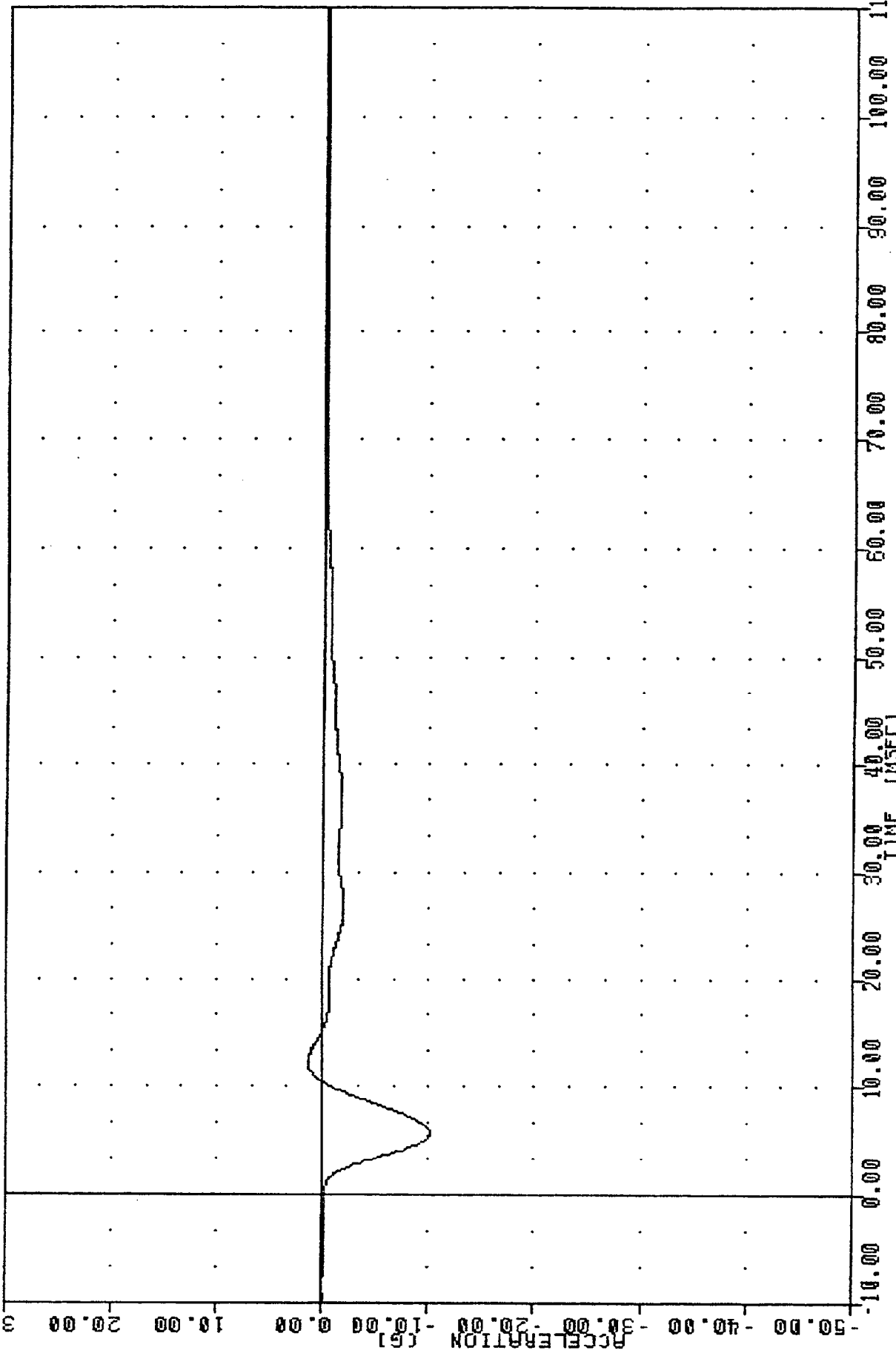
SIDE IMPACT DUMMY CALIBRATIONS

SIDE IMPACT DUMMY CALIBRATION
DUMMY SERIAL NUMBER 119

TEST/ DATE	CHANNEL	FILTER CLASS	PEAK ACCELERATION (g) SPECIFICATION*	TEST RESULT
HEAD	HEAD Y-AXIS	1000	150-175	167.22
THORAX	UPPER SPINE Y-AXIS			
	PRIMARY	180	16-24.6	22.75
	REDUNDANT	180	16-24.6	DNA
	LOWER SPINE Y-AXIS			
	PRIMARY	180	17.6-26.4	20.36
	REDUNDANT	180	17.6-26.4	20.65
	RIGHT UPPER RIB Y-AXIS			
	PRIMARY	180	36-50	43.18
	REDUNDANT	180	36-50	DNA
	RIGHT LOWER RIB Y-AXIS			
PRIMARY	180	36-50	40.79	
REDUNDANT	180	36-50	40.22	
PELVIS	PELVIS Y-AXIS	180	50-65	54.37

*Side impact test specifications currently in use by VRTC-NHTSA.

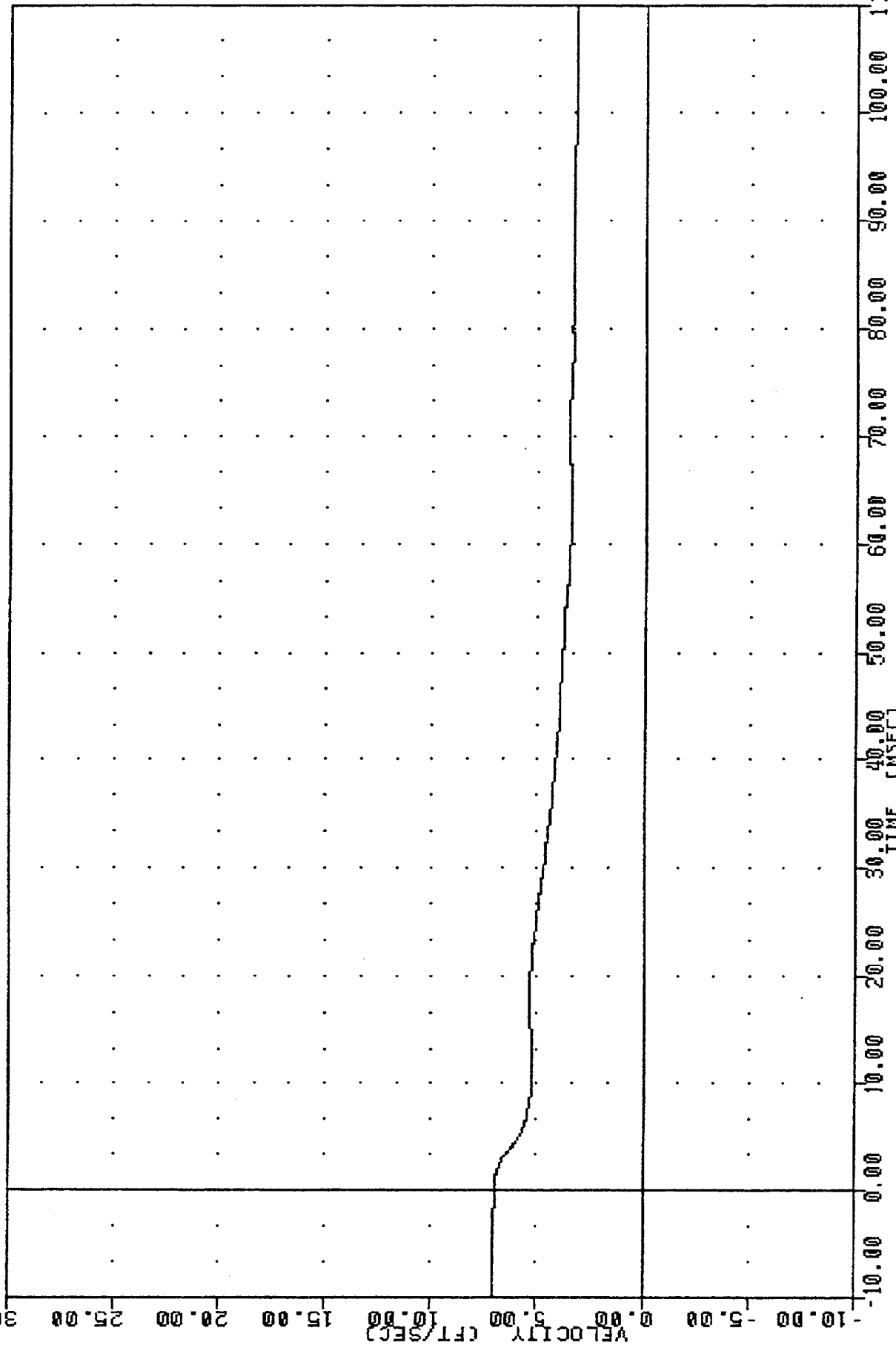
NVMA
 SID 119/017 HEAD IMPACT CAL 04
 85144
 PISXG
 PLOT DATE 12-JUN-85 09:13:50
 FILTER = BLPF 100/ 316/ -40
 MIN. MAX VALUES = -10.15e 5.75, 1.34 e 12.25



MVMA SIDE IMPACT DUMMY CALIBRATION
 PISTON ACCELERATION

MVMA SH11901 12-JUN-85 09:13:50
 SID 119/017 HEAD IMPACT CAL 04
 85144
 PISXV

FILTER = ALPF 1650/ 5214/ -40
 MIN. MAX VALUES = 3.23e 107.63, 7.05 e -9.38

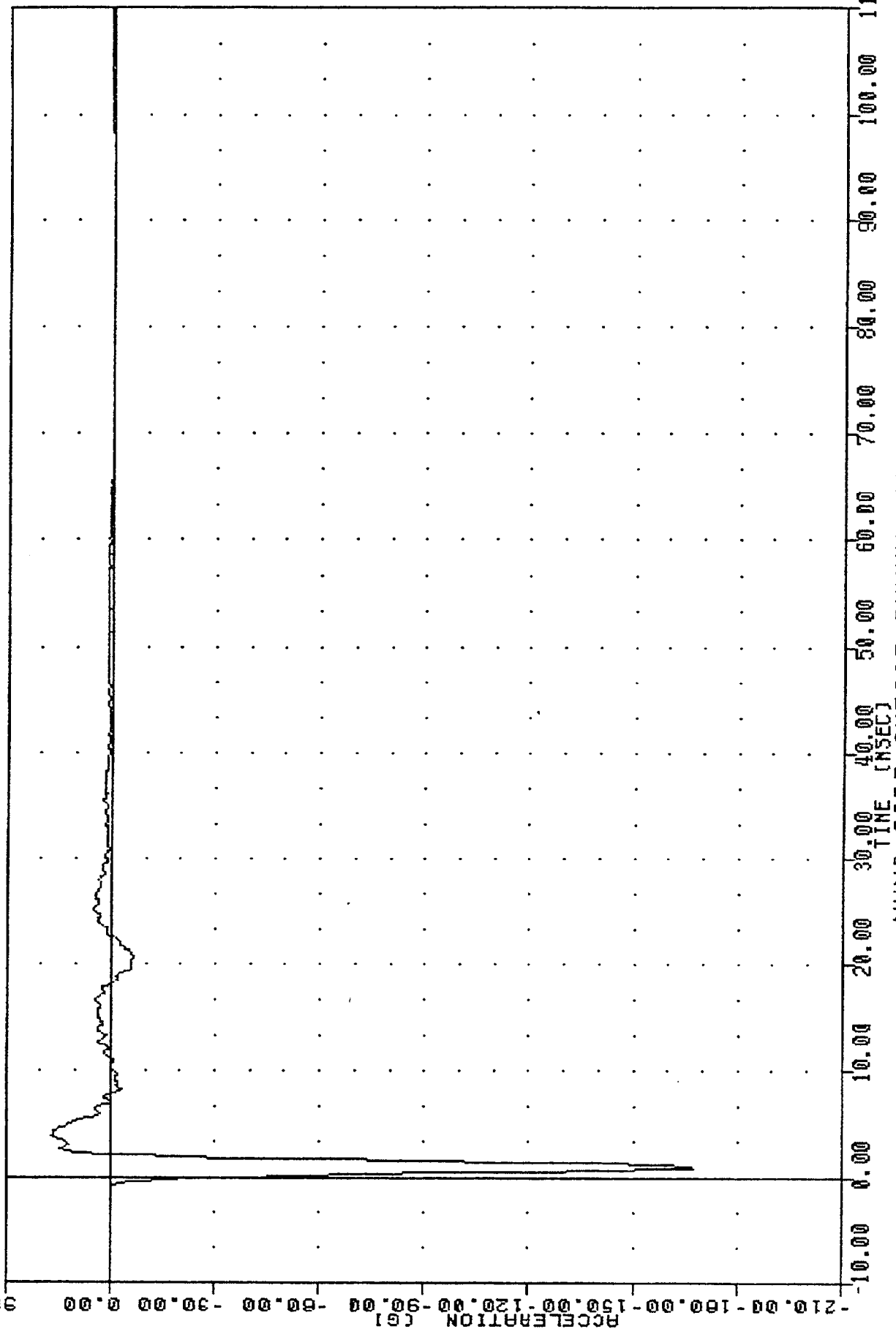


MVMA SIDE IMPACT DUMMY CALIBRATION
 PISTON VELOCITY

MYMA SH11901 12-JUN-85 09:13:50
SID 119/017 HEAD IMPACT CAL 04

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = -167.22 0.88, 16.78 3.88

85144
HEDY6

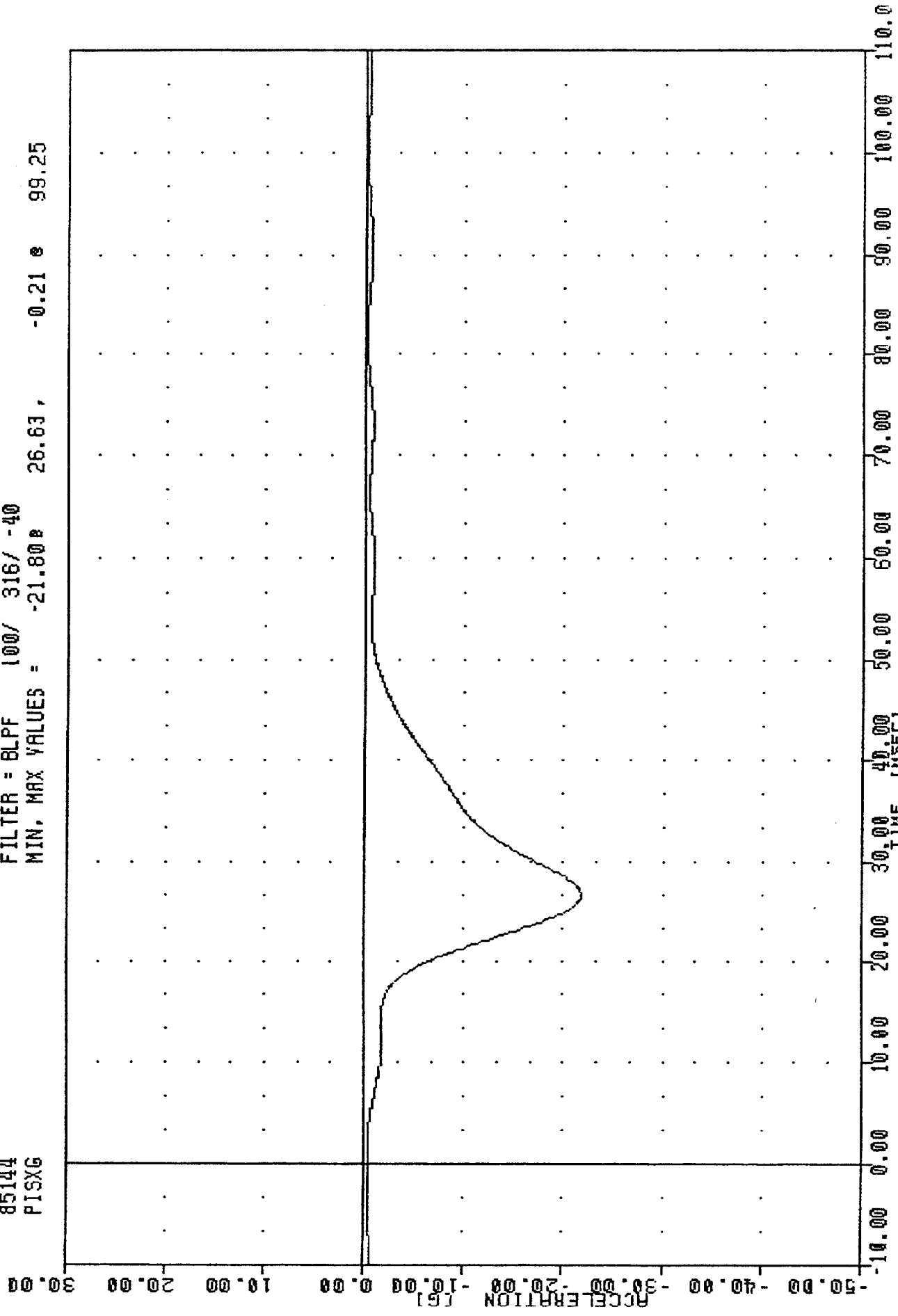


MYMA SIDE IMPACT DUMMY CALIBRATION
HEAD ACCELERATION Y AXIS

NVMA
SID 119 THORAX IMPACT CAL 01
85144
PISXG

PLOT DATE 12-JUN-85 10:49:33

FILTER = 8LPF 100/ 316/ -40
MIN, MAX VALUES = -21.80 26.63, -0.21 e 99.25



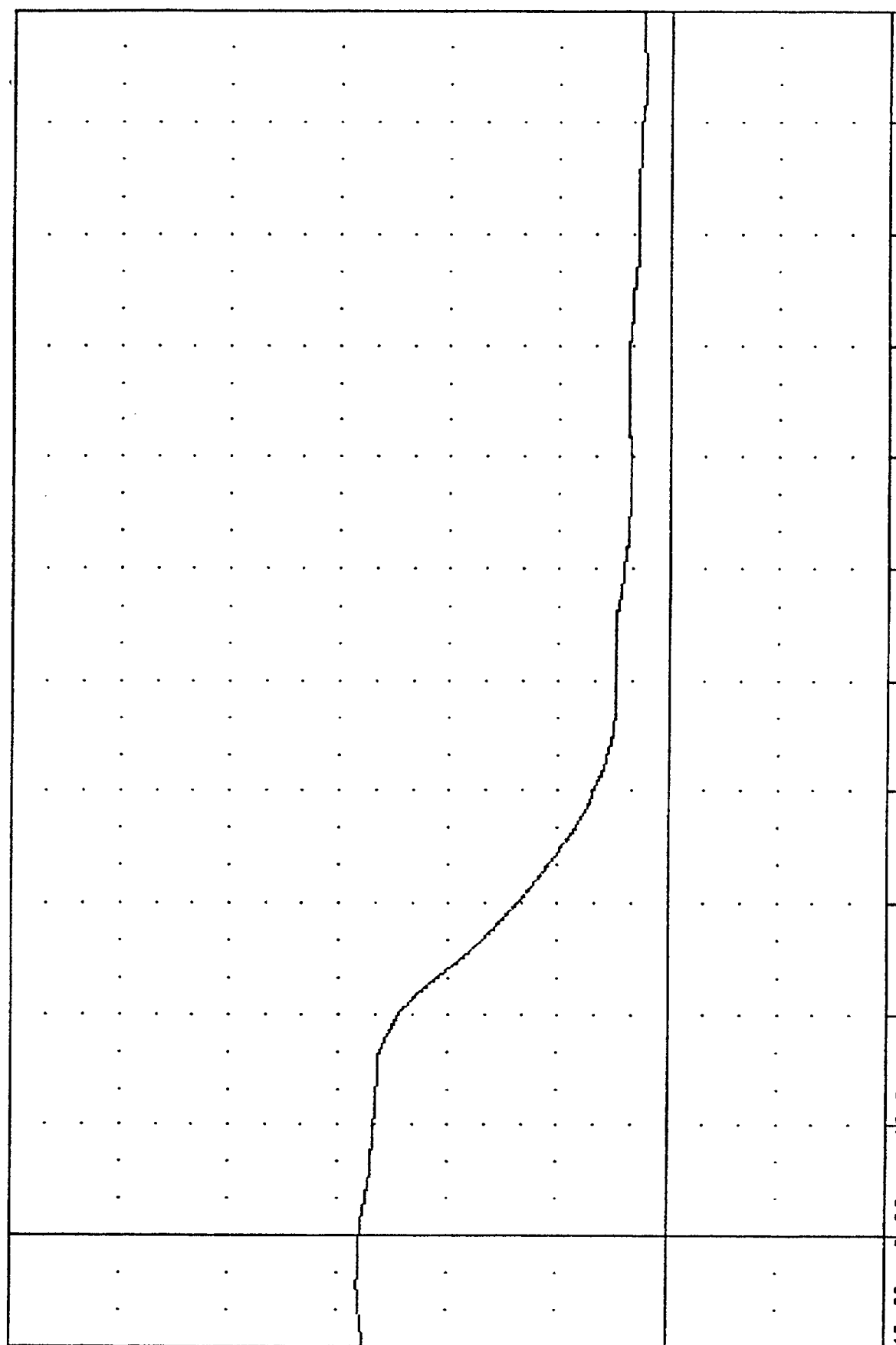
NVMA SIDE IMPACT DUMMY CALIBRATION
PISTON ACCELERATION

MVMA ST11901
 SID 119 THORAX IMPACT CAL 01
 85144
 PIXV

PLOT DATE 12-JUN-85 10:49:33

FILTER = ALPF 1650/ 5214/ -40
 MIN, MAX VALUES = 1.10e 103.75, 14.12 e -4.50

VELOCITY (FT/SEC)



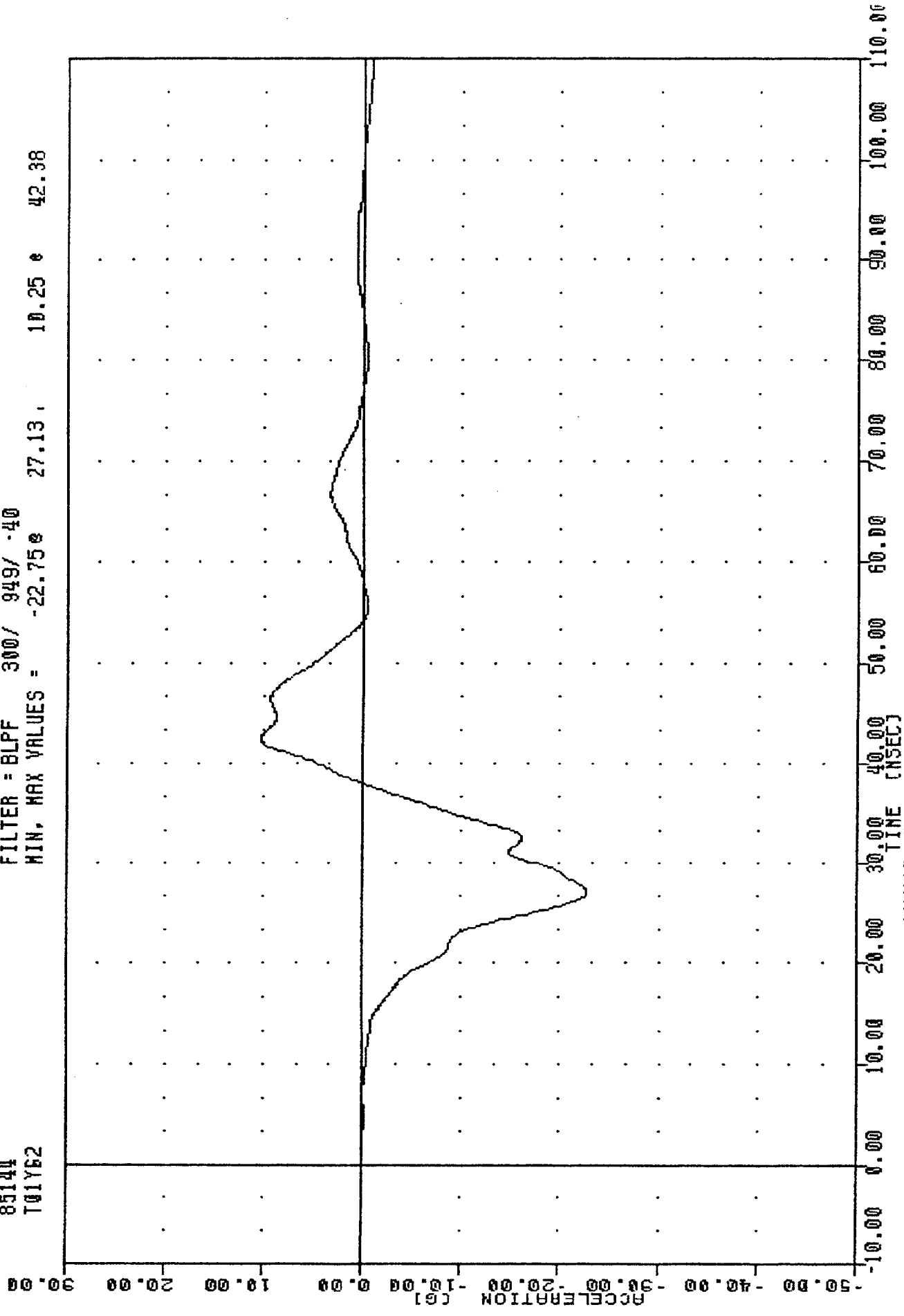
TIME (MSEC)

MVMA SIDE IMPACT DUMMY CALIBRATION
 PISTON VELOCITY

MVMA
SID 119 THORAX IMPACT CAL 01
85144
T01Y62

PLOT DATE 12-JUN-85 10:49:33

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -22.75e 27.13, 10.25 e 42.38

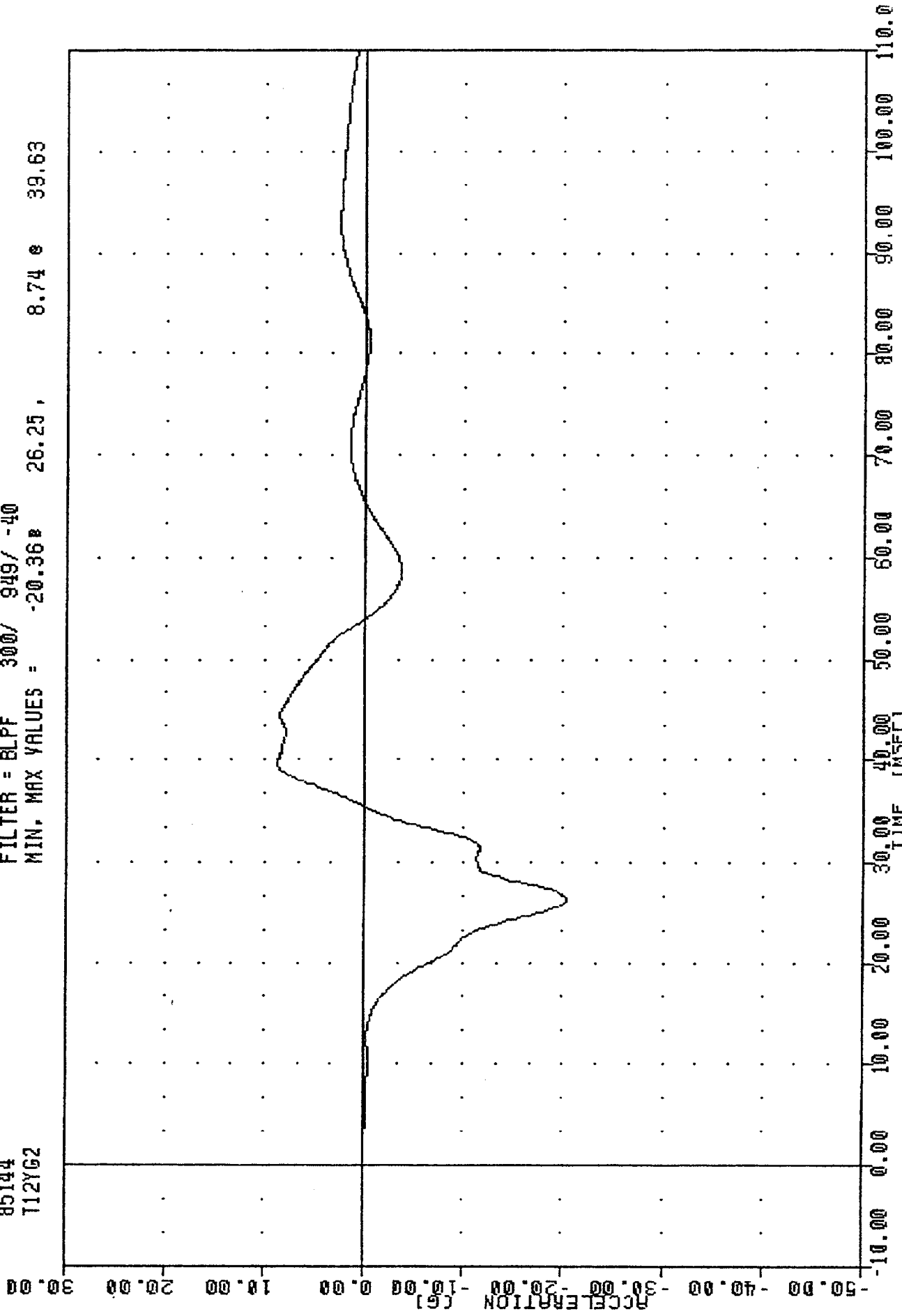


MVMA SIDE IMPACT DUMMY CALIBRATION
UPPER SPINE ACCELERATION Y AXIS -PRIMARY

NYMA
SID 119 THORAX IMPACT CAL 01
85144
T12YG2

PLOT DATE 12-JUN-85 10:49:33

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -20.36 26.25, 8.74 e 39.63

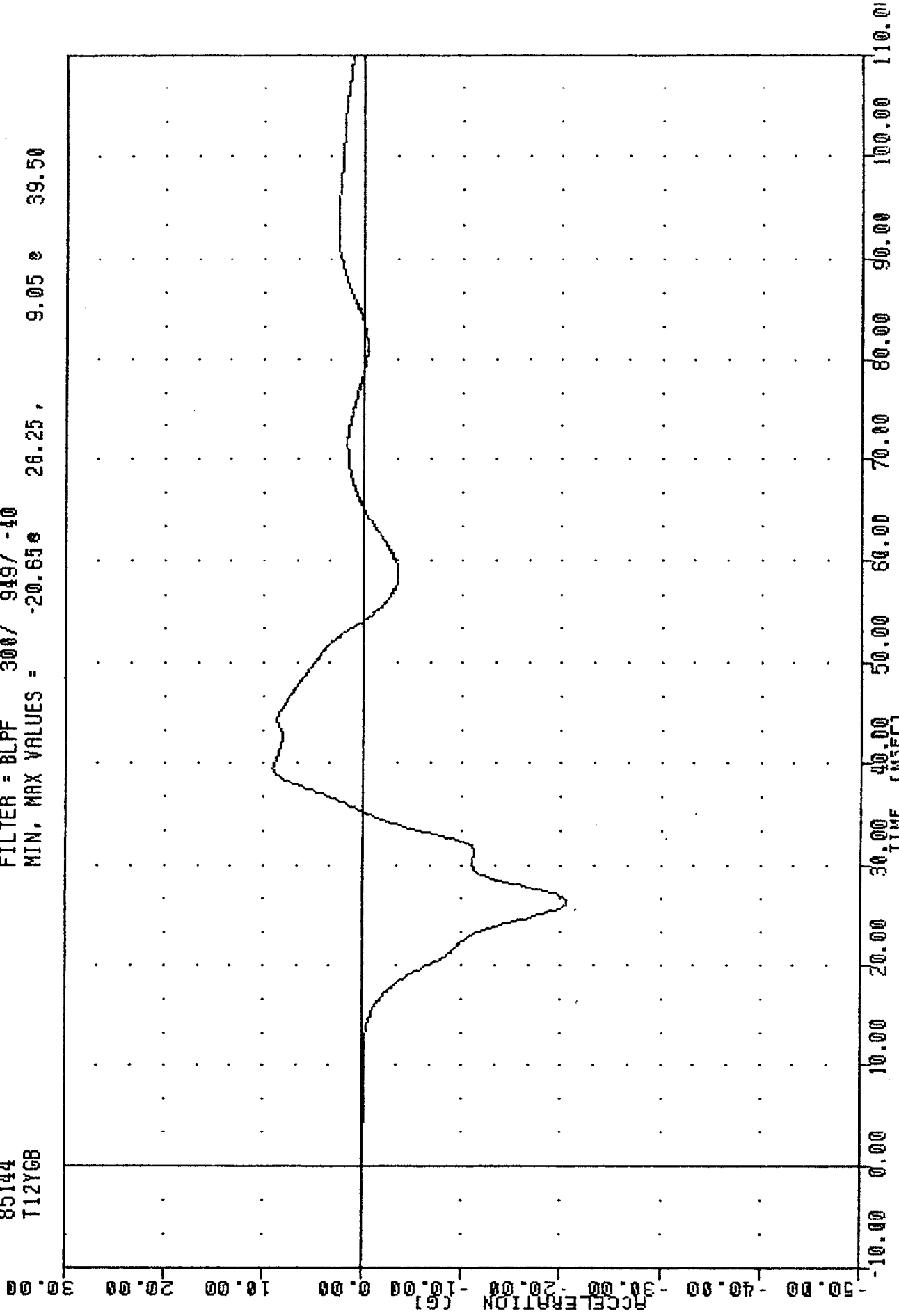


NYMA SIDE IMPACT DUMMY CALIBRATION
LOWER SPINE ACCELERATION Y AXIS -PRIMARY

MVNA
SID 119 THORAX IMPACT CAL 01
85144
T12YGB

PLOT DATE 12-JUN-85 10:49:33

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -20.65e 26.25, 9.05 e 39.50

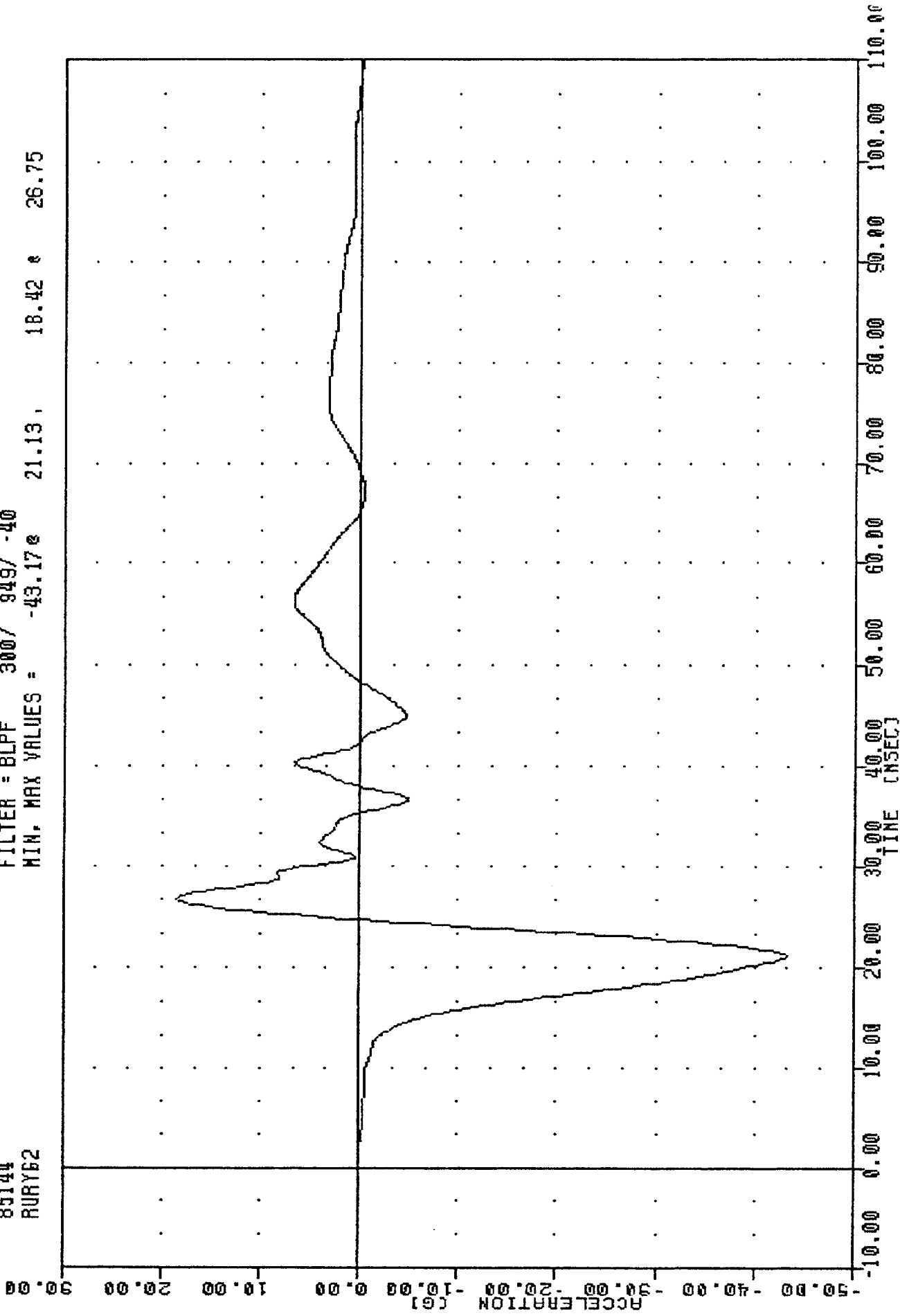


MVMA SIDE IMPACT DUMMY CALIBRATION
LOWER SPINE ACCELERATION Y AXIS - REFUNDANT

MYMA
SID 119 THORAX IMPACT CAL 01
85144
RURY62

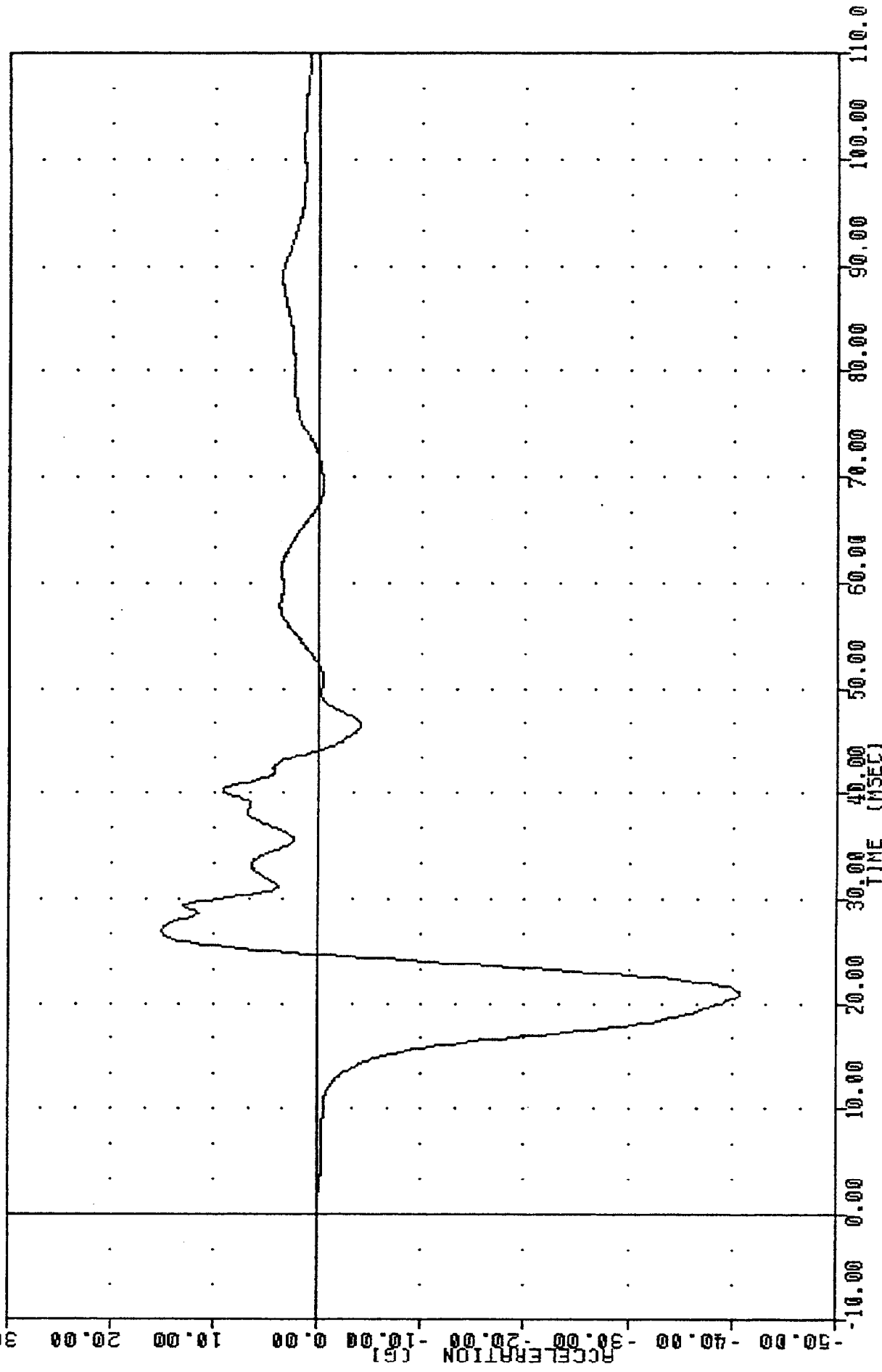
PLOT DATE 12-JUN-85 10:49:33

FILTER = BLPF 300/ 949/ -40
MIN, MAX VALUES = -43.17e 21.13, 18.42 e 26.75



MYMA SIDE IMPACT DUMMY CALIBRATION
RIGHT UPPER RIB ACCELERATION Y AXIS -PRIMARY

NYMA
 SID 119 THORAX IMPACT CAL 01
 85144
 ALRY62
 PLOT DATE 12-JUN-85 11:02:27
 FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -40.79 21.00 15.02 e 26.75

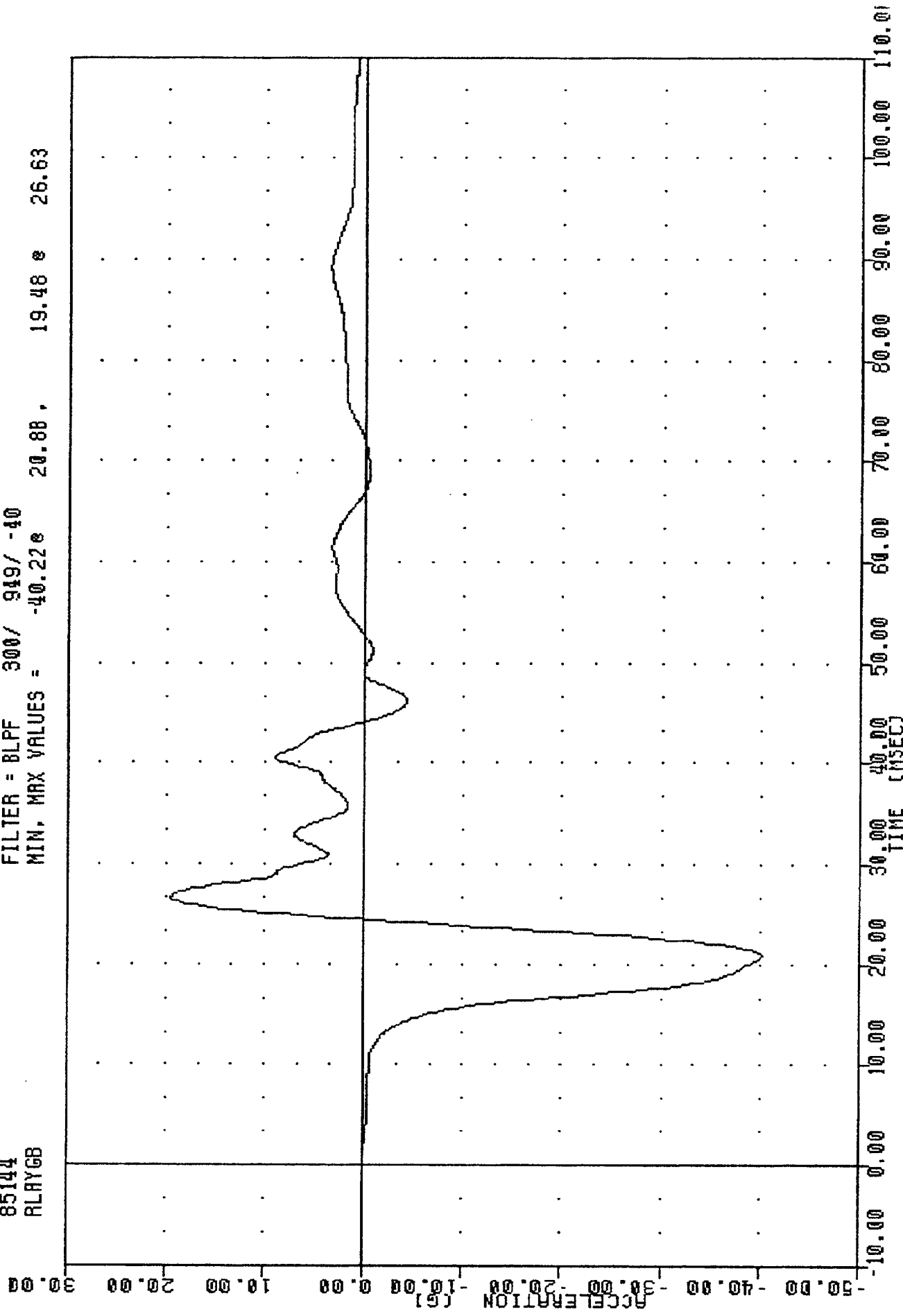


MVMA SIDE IMPACT DUMMY CALIBRATION
 RIGHT LOWER RTR ACCIFRATION Y AXIS -PRIMARY

MVNA
ST11901
SID 119 THORAX IMPACT CAL 01
85144
ALRYGB

PLOT DATE 12-JUN-85 10:49:33

FILTER = BLPF 300/ 949/ -40
MIN. MAX VALUES = -40.22e 20.88, 19.48 e 26.63

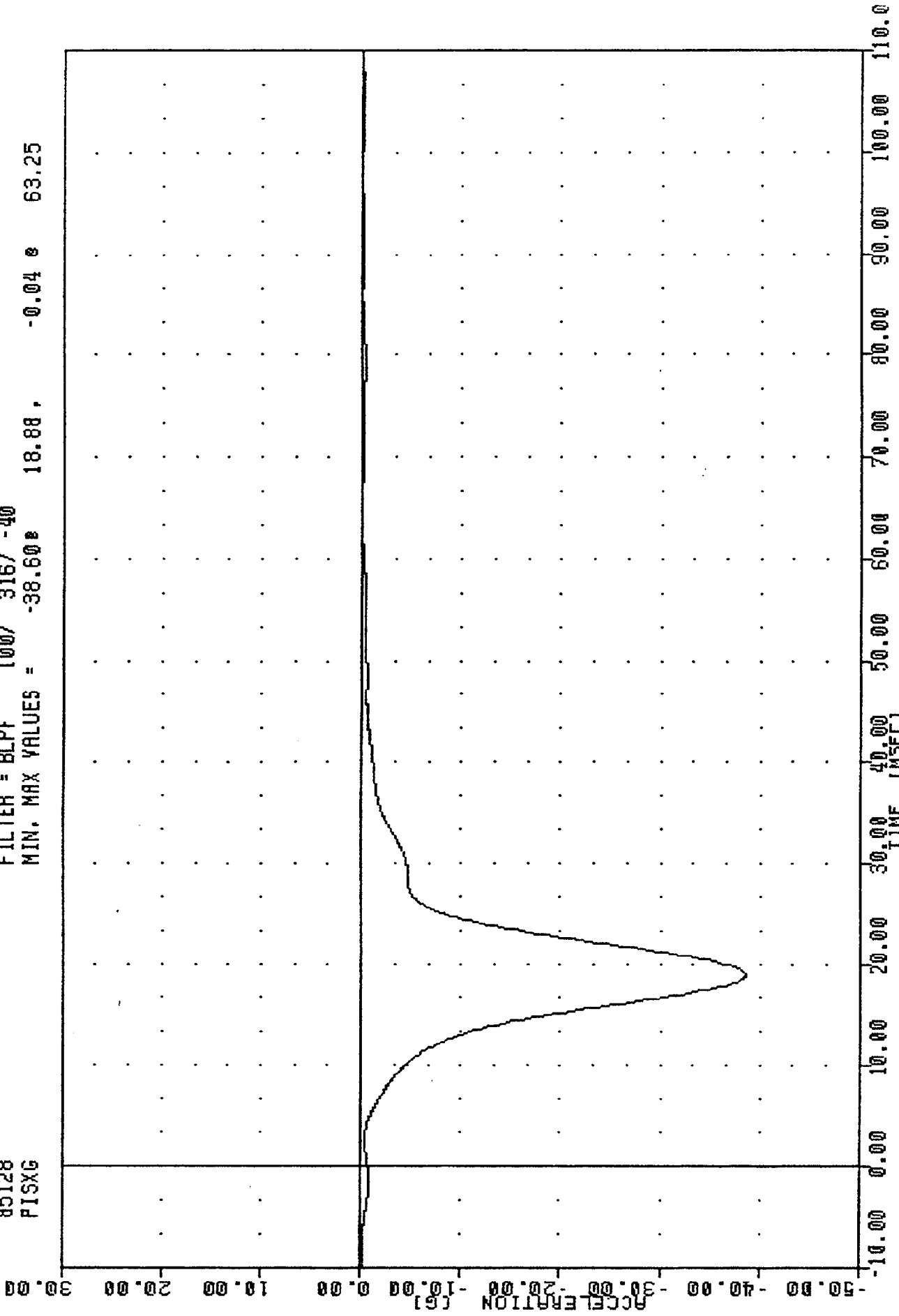


MVNA SIDE IMPACT DUMMY CALIBRATION
RIGHT LOWER RTA ACCELERATION Y AXIS -REINFORCED

MVMA
SID 119 PELVIC IMPACT CAL 01
85128
PISXG

PLOT DATE 12-JUN-85 10:59:06

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -38.60e 18.88 , -0.04 e 63.25

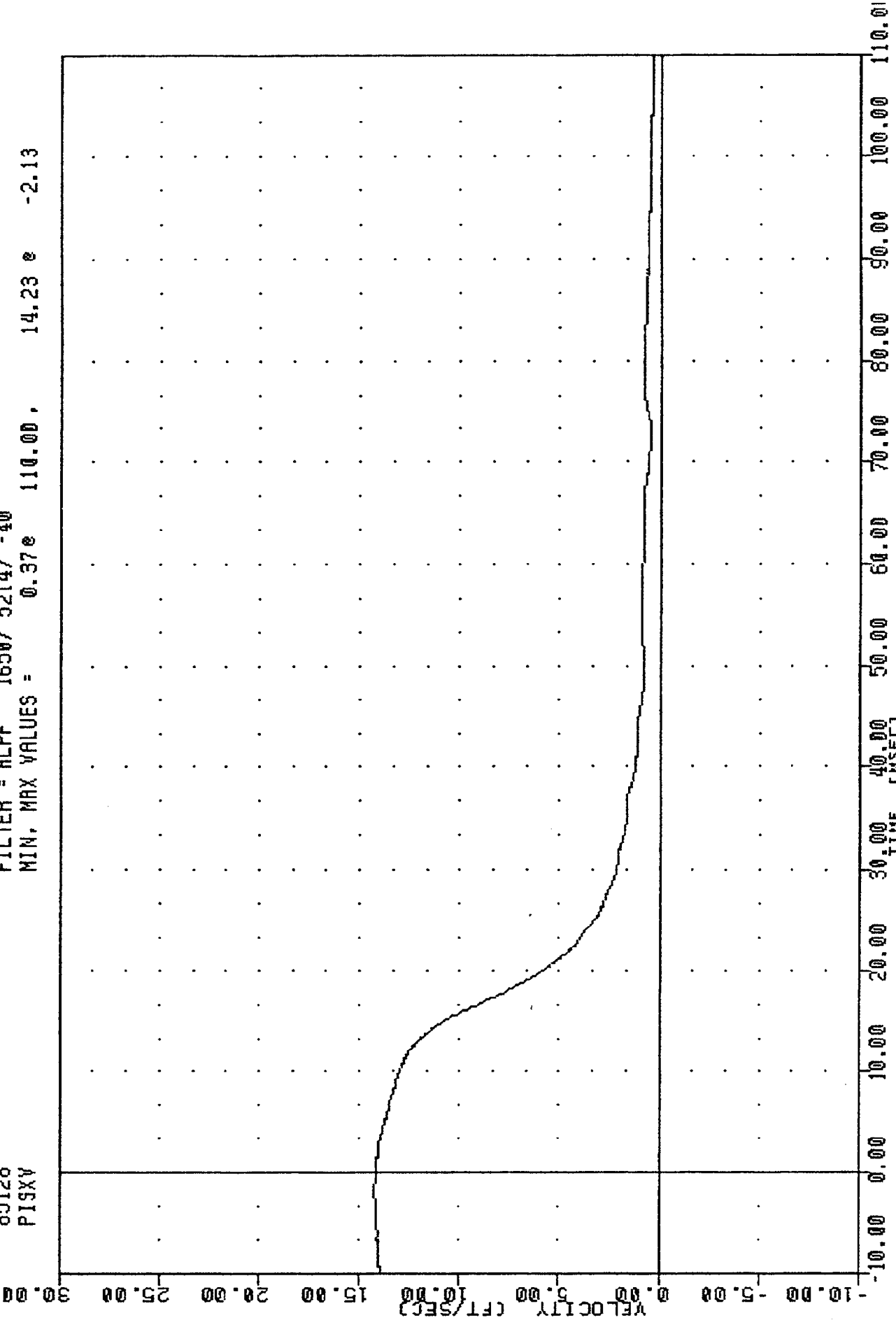


MVMA SIDE IMPACT DUMMY CALIBRATION
PISTON ACCELERATION

MYNA , SP11901
SID 119 PELVIC IMPACT CAL 01
85128
PIXY

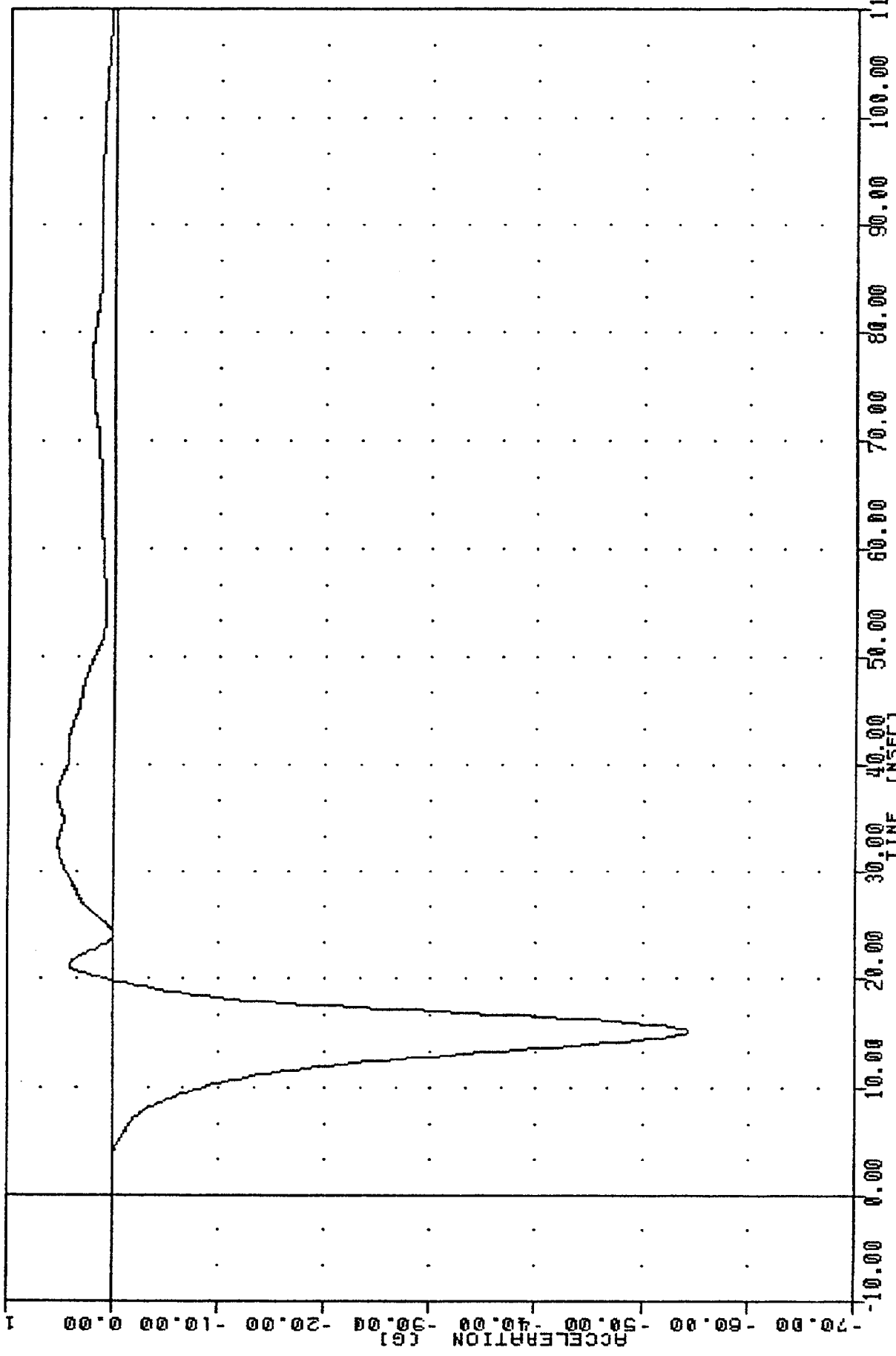
PLOT DATE 12-JUN-85 10:59:06

FILTER = ALPF 1650/ 5214/ -40
MIN, MAX VALUES = 0.37e 110.00, 14.23 e -2.13



MYNA SIDE IMPACT DUMMY CALIBRATION
PISTON VELOCITY

MVMA
 SID 118 PELVIC IMPACT CAL 01
 85128
 PEVY6
 PLOT DATE 12-JUN-85 10:59:06
 FILTER = BLPF 300 / 949 / -40
 MIN. MAX VALUES = -54.37e 15.13 , 5.28 e 37.13



MVMA SIDE IMPACT DUMMY CALIBRATION
 PELVIS ACCELERATION Y AXIS